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Director Liability Protection and the Quality of Outside Directors

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Abstract

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Keywords: Legal liability, board of directors, board quality, litigation, derivative suits

JEL Classifications: G30, G34

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"Corporate directorship had become a 'job nobody wants.'"

Baum, L., Byrne, J.A., *Business Week*, September 8, 1986, 56-61.

"Limiting the potential liability of directors will enhance the company's ability to attract and retain qualified individuals."

- The 1989 proxy statement of American Business Products Inc.

"Board seats are going begging [again]."

- Anne Fisher, *Fortune*, May 16, 2005.

"24.5% of bank respondents advised [the American Association of Bank Directors] AABD that at least one of the following had occurred during the past five years: director candidate refused offer to become director ..., director resigned ..., director refused to serve on Board Loan Committee or resigned from that committee because of fear of personal liability."

- AABD survey results on measuring bank director fear of personal liability are not good news, April 9, 2014[1]

1. Introduction

In this study, we test whether director litigation protections facilitate the recruitment and retention of high caliber outside directors (the talent attraction and retention hypotheses). This topic has previously received limited research attention, although companies, practitioners and director candidates widely assert that this is a serious concern, as illustrated in the opening quotes.[2] Directors owe fiduciary duties to shareholders and thus, can be sued by shareholders for perceived breaches of these duties. However, after decades of debate in the U.S., the question of whether directors should be subject to shareholder litigation risk or be protected from such risk remains unsettled. An important reason for this ambiguity is that there are from shareholders' point of view both costs and benefits of providing directors with litigation protections.

On one hand, director exposure to litigation risk has an important deterrence value and creates stronger director incentives to work faithfully and with due diligence, thereby lowering agency costs. On the other hand, a high (low) level of litigation risk could cause directors to become overly

[1] See http://aabd.org/aabd-survey-results-measuring-bank-director-fear-personal-liability-good-news/

[2] In this study, we define 'director liability" or 'liability risk' as the risk of litigation faced by outside directors, rather than their out-of-pocket personal liability. For brevity, we use director protections to denote director liability protections.

conservative (aggressive) in terms of corporate risk-taking at the expense of shareholder value. Beyond the (ex-post) incentive effects of litigation risk, litigation risk may crucially affect the ex-ante recruitment and retention of outside directors (that impacts director and board quality).[3] This reflects outside director candidates' risk aversion (Amihud and Lev, 1981; May, 1995) and the fact that director compensation tends to be small relative to the potential liability risk of being a fiduciary (Romano, 1989). Also, director candidates can find the time and reputation costs associated with shareholder litigation onerous. This leads firms to frequently lament that insufficient director protections make it difficult to attract and retain good outside director candidates (Davis, 2008), which is vividly illustrated in the 1989 proxy statement of American Business Products Inc. cited at the opening of this paper.

While there are many studies on the ex-post incentive effects of director legal liability protections (e.g., on firm policies and performance), evidence on the talent attraction and retention hypotheses is surprisingly sparse. A company's success, however, depends crucially on the quality of its directors. This is because even if directors work diligently, if they are inexperienced, incompetent, exhibit poor judgement, or are prone to adopting poor strategies, then shareholders will suffer (Hermalin and Weisbach, 2017).[4] The limited attention paid to how director litigation protections affect board quality is, therefore, puzzling because abundant anecdotes exist and many surveys have reported, including the recent AABD survey cited above, that litigation risk is an important consideration for outside candidates when deciding whether to join a corporate board. Reasons for this lack of evidence on the talent attraction and retention hypotheses may include difficulties in measuring director litigation protections and director quality (which is a multifaceted concept), and in identifying a suitable experimental setting that provides exogenous variation in outside director litigation risk. Existing firm-level director protection measures such as liability-limiting provisions (LLPs) stipulated in firm charters/bylaws and D&O insurance often exhibit

[3] In the paper, "ex-ante" refers to the stage before an outside candidate joins the board, and 'ex-post" refers to the stage after an outside candidate is appointed or re-appointed to the board.

[4] There are numerous anecdotes to support the need to recruit high-quality directors. Tom Neff, Chairman of Spencer Stuart, said in 2005 that "some of the most *experienced* board members are unavailable [after SOX]." (Emphasis is added by the authors.) A Wall Street Journal article carried a title "More CEOs Say 'No Thanks' To Board Seats" (by Anita Raghavan, *The Wall Street Journal*, January 28, 2005, https://www.wsj.com/articles/SB110686483968738543).

limited time series variation, and more importantly they are endogenous firm choices, which generally precludes using them for causal inference.

Our study departs from the extant large literature on the litigation risk effects on director ex-post incentives and resulting impacts on corporate financial decisions/performance by instead focusing on the impacts on director quality. More specifically, we exploit the staggered passage of state Universal Demand laws that exogenously reduce litigation risk as a quasi-natural experiment and conduct a difference-in-differences (DiD) analysis of the talent attraction and retention hypotheses. Throughout this study, a high-quality director is defined as a director who has higher capability (measured by experience) or credentials (education and professional background).[5] Yet, it is important to note that a high-quality director do not necessarily have stronger ex-post incentives to perform after joining a board. This is because such incentives are also shaped by litigation risk and other factors such as the level and structure of director remuneration, reputation incentives, existing governance mechanisms, etc.

In the U.S., shareholder litigation includes 1) class-action lawsuits brought by shareholders who feel they have been directly harmed by certain company behavior (e.g., financial misreporting that inflates stock price) and 2) derivative lawsuits brought by shareholders on behalf of the company when the board or some of its members causes harm to the company and thereby indirectly damages shareholder interests. Unlike class-action suits, any recovery from a derivative suit accrues to the company, rather than to plaintiff shareholders. Derivative suits can be triggered by a wide range of actions including misreporting, disclosure irregularities, insider trading, board failure to prevent company misconduct, inappropriate executive compensation, and questionable mergers and acquisition (M&A) deals. The passage of the 1995 Private Securities Litigation Reform Act (PSLRA) substantially raised the hurdle for filing shareholder class action suits, and shareholders responded by increasing the use of derivative suits (Davis, 2008) or simultaneously filing both securities class actions and derivative suits for the same cause of action (Erickson, 2010). As a result, shareholders tended to file more derivative suits than securities class actions, and derivative suits

[5] We detail our measurements of quality later in this section.

became a major tool for activist shareholders and attorneys eager to discipline company directors (Erickson, 2010).

There are different views on the financial compensation and governance effects of derivative suits (see Romano (1991) for derivative suits being frivolous and Feris et al. (2007) for derivative suits addressing managerial problems). Regardless of whether these suits are frivolous or meritorious, they can constitute a serious litigation threat for risk-averse outside directors. As we discuss in detail in Section 2.2, derivative suits may impose significant costs on outside directors by raising: (1) the small probability of a substantial out-of-pocket financial liability (due to legal restrictions on corporate indemnifications in derivative suits and the potential insufficient D&O insurance coverage after paying large legal defense costs), (2) the expected director time and effort required to defend against such lawsuits along with the distraction associated with these lawsuits, and (3) director reputation damage that can lead to adverse labor market consequences as shown in several prior studies.[6] Therefore, the best protection against litigation risk for risk-averse outside directors is ex ante to discourage the initiation of shareholder litigation, rather than to merely have ex-post financial liability protection, which does not preclude litigation. It is important to note that in derivative suits plaintiffs typically strategically target *all*, rather than specific individual directors to circumvent the onerous demand requirement explained below.

To reduce incidences of frivolous derivative suits and better protect directors, a total of 23 U.S. states passed universal demand statutes (hereafter as "UD") between 1989 and 2005 that requires shareholders to obtain board support before a derivative suit can commence. Under a UD statute, courts will not second-guess a board's refusal to act on shareholder demands, provided that it is a business judgement made by disinterested and independent directors (Moodie, 2004). Given the formidable procedural barrier created by UDs, director litigation risk declined significantly in the adopting states.[7] Accordingly, we expect high caliber outside candidates to become more willing to serve on boards of firms incorporated in UD-states if the talent attraction and retention hypotheses

[6] Fich and Shivdasani (2007) and Brochet and Srinivasan (2014) provide evidence on the cost of reputation loss for directors named as defendants in securities class actions. It is reasonable to expect that this also holds in derivative suits.
[7] Appel (2019) finds that the probability of derivative suits drops by about 40% after UD adoptions, and Lin et al. (2020) confirm a dramatic decrease in the total number of derivative suits after UD adoptions.

are valid. On the other hand, UDs only govern derivative suits, and have no impact on shareholder class action suits. Directors also enjoy various other legal protections from LLPs stipulated in a firm's charter/bylaw (to the extent permitted by state law) and D&O insurance coverage. Thus, it is possible that UD adoption may not add important legal protection that produces a measurable effect on the recruitment and retention of high caliber directors. These possibilities mean that whether lower litigation risk resulting from UD law adoptions actually facilitates the recruitment and retention of higher caliber outside directors is an empirical question.

We select ten director quality characteristics, which are hand-collected from corporate proxy filings, and divide them into two broad categories: an experience metric and a credential-based metric (educational and professional background). Characteristics reflecting a director's experience include general managerial experience as a key executive at other firms, experience at firms having superior performance, experience at firms active in successful innovative activity, director experience at an S&P 1500 firm, and the number of outside directorships held. Characteristics pertaining to a director's educational and professional background include several educational, financial, legal, and (same) industry expertise. Following Ellul and Yerramilli (2013), Qin et al. (2018), Hoi et al. (2019), and Chen et al. (2020), we calculate the first principal component of the five characteristics in each of these two categories to summarize the quality of outside directors.

We find that the quality of nominated outside directors improves following UD adoption, measured in terms of their experience relative to industry-size-year matched control firms incorporated in states without UDs. The results are robust to using a simple aggregation of the respective binary quality component variables, and also hold if we require industry-size-year matched control firms to be headquartered in the same state or headquartered in a nearby adjacent state (within 100 miles), but incorporated in a different state. The latter result is important since we want treatment firms and control firms to have a similar economic environment based on their headquarters locations, while their primary difference is due to different state corporation laws that imply different levels of litigation risk faced by these outside directors.

Interestingly, following UD adoptions, we find only weak evidence that the educational and professional backgrounds of outside directors improves. This evidence comes primarily from firms

incorporated in Pennsylvania where UD adoption was a non-political judicial decision as well as more generally from firms facing higher litigation risk. One possible reason why boards show greater improvement in outside director experience after UD adoption is that experienced directors are more time constrained or more concerned about potential reputational losses arising from shareholder litigation and consequently are in short supply. In contrast, the supply of candidates with educational credentials (degrees, financial, legal and industry background) is likely to be much larger and thus easier to recruit. Also, firms may value demonstrated board experience more than educational qualifications and technical background in selecting new directors (Tenenbaum, 2017).

Our results are consistent with a causal interpretation since they do not exist before UD adoption, and they hold after UD adoption in Pennsylvania through a state Supreme Court ruling in *Cuker v. Mikalauskas* (1997) that is free of any corporate lobbying concerns. In robustness analysis, we find no evidence that these results are due to: (1) the passage of the Sarbanes-Oxley Act (SOX) and the ensuing NYSE and NASDAQ listing rule changes that required independent boards, (2) changes in various state antitakeover laws, or (3) changes in the way a firm compensates its outside directors. Neither is the finding a result of false positives arising from the reuse of the UD law setting. In addition, there is evidence that following UD adoptions, high-quality director candidates in non-UD states are more willing to join the boards of firms in UD-adopting states.

We find some limited support for the talent retention hypothesis. Specifically, while UD adoptions lower the voluntary departure rate of high-quality directors, the departure rate of other outside directors similarly drops. The evidence is consistent with litigation risk being only one factor influencing a director's retention decision, and that other factors can also affect the retention of existing directors, e.g., relationship with the CEO and the availability of outside job options (Faleye, 2007), as well as possible board changes following a CEO turnover (Denis and Sarin, 1999).

We also examine the heterogeneous effects of UD protections on the recruitment of outside director across firms. We find that the talent attraction effect is more pronounced when director quality is measured by experience in firms facing higher litigation risk and in high-technology industries that tend to make large risky investment decisions. This evidence is confirmation that UD adoptions improve director quality through the litigation risk channel. In our tests, we classify firms

as having high litigation risk when firms operate in an industry that experiences more frequent derivative suits or are involved in frequent M&A transactions where shareholder lawsuits are more common (Thompson and Thomas, 2004; Lin et al., 2011).

We also find that the effect of UD adoptions on outside director recruiting does not significantly vary with the extent of liability-limiting provisions (LLPs) stipulated in a firm's charters/bylaws before UD adoption, suggesting that the litigation protection afforded by UDs to directors is particularly valuable because it helps reduce the likelihood of derivative suits. In contrast, LLP protections only limit the amount of director financial liability in the event of shareholder litigation. This helps explain why given the existence of LLPs, state legislatures still pass UDs. Echoing Knyazeva et al.'s (2013) finding that local director labor market influences outside director recruiting, we also find that the effect of UD adoptions on outside director quality (measured by the experience metric) is stronger at firms near smaller pools of local director candidates, and therefore at firms that face greater difficulties in recruiting outside directors.

We also evaluate whether our findings can be driven by firms' increased demand for high-quality directors post-UD adoption, rather than by an improved supply of willing high-quality director candidates (see Section 4.7.2). Since director recruitment is a mutual selection process, it is difficult to rule out the possibility that firm demand plays a role in recruiting high-quality outside directors. For example, boards may place greater value on the demonstrated experience of directors, rather than merely on their credentials. However, in order to explain our results any demand-based argument (if valid) must also be predicated on a larger supply and greater willingness of high-quality director candidates to serve, which is our primary hypothesis.

Our primary contribution to the literature is to provide new evidence on the talent attraction and retention hypotheses. Using a sample of reincorporations announced between 1980 and 1992, Heron and Lewellen (1998) find a positive market reaction if a firm's stated reason for reincorporation is to limit director liability to attract outside directors. These firms subsequently increase outside director representation by 4.9% in two years after reincorporation. Their study confirms that outside candidates value liability protections, but they do not examine whether there is a change in the quality of outside directors. Bradley and Chen (2011) is the only published study

using U.S. data to test the talent attraction and retention hypotheses. In examining how director protections affect bond yields, they relate LLP protections in corporate charters/bylaws to the appointment and departure rates of high-quality directors (i.e., those having additional board seats at other firms or being active executives at other firms), but they find no significant results. Exploiting exogenous changes in state law rather than endogenous LLP adoptions, reincorporations, or D&O insurance purchases, we are the first study to find evidence supporting the widely claimed talent attraction and retention hypotheses in the U.S.

Our evidence, together with the abundant extant evidence on how litigation risk affects the ex-post incentives of directors (and officers), facilitates a better understanding of the pros and cons of director litigation protections.[8] We find some evidence that a large improvement in outside director quality following the UD adoption is associated with a more positive change in operating performance around UD adoption when close shareholder monitoring is able to constrain the adverse director incentives resulting from UD adoption. Our result that UD adoption makes it easier for firms to attract and retain high caliber outside directors may help explain why on average UD adoption is only associated with a small reduction in firm value (Appel, 2019).

2. Institutional background and hypothesis development

2.1 Shareholder derivative suits and Universal Demand laws

Under state corporation law, a board of directors has an obligation to hold third parties (e.g., a director or officer of the firm) responsible for harmful actions against the firm. Therefore, before shareholders can bring a derivative suit, they are required to demand that the board take corrective actions. If the board responds positively to the demand, then it agrees either to take corrective actions or to sue the responsible directors and/or officers. At least some directors are typically

[8] Some early event studies based on a small sample size (e.g., Netter and Poulsen, 1989; Janjigian and Bolster, 1990; Brook and Rao, 1994) find either insignificant or weakly negative market reactions to increasing director protections. Later studies (e.g., Chung and Wynn, 2008; Wynn, 2008; Zou et al., 2008; Lin et al., 2011, 2013, 2019; Aguir et al., 2014; Donelson and Yust, 2014; Appel, 2019) find evidence generally consistent with a net cost to director protections: where protections tend to exacerbate agency problems by lowering director vigilance and increasing their risk-taking. On the other hand, some studies (e.g., Guan et al., 2019; Chu and Zhao, 2020; Lin et al., 2020) find that liability protections have a bright side by facilitating a firm's innovation activities and more profitable M&A transactions.

named as defendants in derivative suits, and boards in most cases dismiss these shareholder demands. When a board rejects such a demand, courts typically do not second-guess a board's dismissal citing the business judgement rule.

There is, however, a futility exception, which allows shareholders to bring a derivative suit without the consent of the board if they can show to the court that making such a demand to the board would be futile. The futility exception can be nominally satisfied if shareholders strategically name all directors as defendants in the suit, so that the board is almost sure to dismiss shareholder demands. Before the passage of UDs, this litigation strategy was often used to circumvent the onerous demand requirement. In addition, outside investors often cannot observe the actual diligence of individual directors and so they are unable to tell which directors have good or bad performance. As a result, director candidates regardless of their behavior or diligence face litigation risk ex ante, which may lead them to refuse to serve on the board.

After a plaintiff files a derivative suit, the defendant seeks the suit's dismissal at which point the plaintiff has an opportunity to come before a judge and argue why demand is futile because of the specific facts of the case. This specific litigation process entails significant judicial time and resources and overburdens courts (Kinney, 1994). The futility exception also enabled some activists to abuse the opportunity to bring frivolous derivative suits.[9] To reduce frivolous derivative suits, which further protects directors from litigation and conserves judicial resources, 23 states between 1989 and 2005 adopted UD statutes that require shareholders to first obtain the board's consent prior to a derivative suit (i.e., mandating the demand requirement), unless doing so could result in irreparable harm to the firm. The court will not overrule the board's demand refusal so long as it falls within the business judgement rule where disinterested independent directors comprising a special litigation committee (SLC) of the board review the demand and decide to dismiss it.[10] Because of the steep legal barrier created by UDs, directors' litigation risk arising from derivative

[9] Romano (1991) argues that many such derivative suits primarily benefit the attorneys involved, leaving little financial returns for the company concerned.

[10] Curtis (2018) develops a model that incorporates meritless suits, value-decreasing suits, and self-interested plaintiffs' attorneys and shows that even given all these potential costs, permitting disinterested SLCs to dismiss shareholder derivative suits may decrease firm value by reducing the ex-ante deterrent threat of litigation.

suits was significantly reduced (Appel, 2019; Lin et al., 2020). Table 1 reports the effective year of each state's UD adoption.

2.2 Hypotheses development

Companies frequently lament that litigation risk makes it difficult to attract and retain high caliber director candidates since outside candidates are risk-averse (Amihud and Lev, 1981; May, 1995; Davis, 2008) and director compensation is often small relative to their potential legal liability (Romano, 1989). An important source of this risk is derivative suits brought by shareholders on behalf of the company that often allege that directors have breached their fiduciary duties. Derivative suits may cover a wide range of causes of actions including misreporting and disclosure irregularities, insider trading, board failure to prevent company misconduct, excessive executive compensation, and questionable M&A deals (Davis, 2008; Erickson, 2010). [11]

After the 1995 PSLRA enactment, which raised the hurdle for filing securities class action suits, shareholders responded by increasing the use of derivative suits (Davis, 2008) or simultaneously filing both securities class actions and derivative suits for the same cause of action (Erickson, 2010). As a result, shareholders tended to file more derivative suits than securities class actions, and derivative suits became a major tool for activist shareholders and attorneys to discipline company directors (Erickson, 2010). Ferris et al. (2007) report that firms with greater managerial agency problems are more likely to become targets of derivative suits, which sue a firm's board to improve board independence, among other governance changes. They conclude that derivative suits are not frivolous as is often claimed, and that such suits can instead serve as an effective governance enhancing mechanism. Curtis (2018) emphasizes that the value of derivative suits is not their ex-post remedial benefit (if any), but their ex-ante deterrence effect. Nevertheless, some derivative suits can be frivolous and there is an ongoing debate over the financial compensation effect and governance effects of derivative suits (Erickson, 2010). Regardless of whether derivative suits are

[11] For example, shareholders of Talmer Bancorp (the bidder) alleged that Talmer's board breached its fiduciary duty of care to shareholders by pursuing a transaction with Chemical Financial Corp (the target) for the benefit of certain board members. In 2017, Tesla's shareholders filed derivative and putative class action lawsuits alleging that Tesla's board and Elon Musk breached their fiduciary duties (of loyalty) by approving the acquisition of SolarCity (founded by Musk and his cousins) to the detriment of Tesla's shareholders.

frivolous or meritorious, they constitute a significant threat to all directors, especially new outside candidates who face increased litigation risk by joining the board.

Derivative suits impose significant costs on outside directors in at least three ways. First, they expose directors to potential monetary losses. In most states, corporate indemnification of directors is limited to the legal defense costs of derivative suits, but it does not cover settlement and damage awards (in contrast, there is no such indemnification limitation in direct class action suits) (Romano, 1991). The monetary losses from lawsuit settlements, albeit rare (Black et al., 2006), can discourage risk-averse candidates from serving as directors, including high-quality candidates, since the potential size of a settlement can easily dwarf a director's annual remuneration (Romano, 1989). Consistent with this argument, almost every outside candidate demands D&O insurance coverage before agreeing to join a board (Lin et al., 2013).

While D&O insurance reduces directors' financial liability, its coverage has two important limitations. D&O insurance at times can be insufficient to pay the full settlement or damage award as it can be exhausted by exorbitant legal fees (Black et al., 2006), thereby still exposing outside directors to (residual) liability risk. For example, the ten former directors of WorldCom and the ten former directors of Enron had to pay a combined total of $31 million to settle shareholder class actions against them after the claims exceeded the available D&O insurance coverage.[12] Since the litigation process is complex and lengthy, legal cost incurred in defending a lawsuit is often unpredictable and can be unexpectedly large, thereby eroding D&O insurance coverage, which can leave an insufficient amount to cover damage awards or settlement fees.

A more important consideration for directors is that D&O insurance does not reduce the incidence of litigation, and it can actually *increase* it since litigation lawyers prefer to target companies with deep pockets including insurance coverage (Gillan and Panasian, 2015). Thus, the existence of D&O insurance cannot alleviate an outside director's concerns about facing potential litigation. Thus, the best protection for outside directors is to prevent the initiation of shareholder litigation, rather than merely provide ex-post coverage of costs incurred, and that is exactly what the UD law does; it substantially reduces derivative litigation risk.

[12] See "U.S. Directors Fear for Own Pockets", Asian Wall Street Journal, January 14-16, 2005.

Derivative suits can cause serious reputational damage for directors who are named as defendants, even if the plaintiffs of such suits do not ultimately prevail (Erickson, 2010). Reputational damage can lead to adverse labor market consequences for these directors. Both Fich and Shivdasani (2007) and Brochet and Srinivasan (2014) provide evidence on the cost of reputation loss for directors named as defendants in securities class actions, and it is reasonable to expect that a similar effect applies to derivative suits. Finally, the typically complex and lengthy litigation process associated with derivative lawsuits can consume significant amounts of director time and energy and distract their attention from important business decisions. However, neither reputational damage, nor the cost of director time and effort involved in fighting litigation is covered by D&O insurance.

UD adoptions make it significantly more difficult for plaintiff shareholders to circumvent the demand requirement by arguing for demand futility in bringing a derivative suit. The result is a significant increase in director litigation protection due to the substantial reduction in the incidence of derivative suits (Appel, 2019; Lin et al., 2020). As a result, director concerns over this potential litigation risk can be mitigated when a candidate is considering joining a board, or an existing director is considering remaining on a board. This reasoning supports the predictions of the talent attraction and talent retention hypotheses.

Of course, UDs only lower the incidence of derivative suits, but not the incidence of shareholder class action suits. In addition, directors already enjoy various other legal protections including liability-limiting provisions (LLPs) stipulated in a firm's charters or bylaws (to the extent permitted by state laws) and D&O insurance coverage. Thus, it is possible that UD adoptions offer directors only minimal incremental litigation protection and so, it may have an insignificant effect on director recruiting and retention. These possibilities mean that whether UD law adoptions facilitate the recruitment and retention of high caliber outsider directors remains an empirical issue.

Faleye (2007) notes that factors affecting a director's retention are more complex than factors affecting a director's initial recruiting. Therefore, the predicted effects of litigation risk on director retention are likely to be weaker than on initial director recruiting for several reasons. First, after a director has been on the board for a term, he or she is likely to have a better understanding of the

company (e.g., its culture, working atmosphere, risks) and may have developed closer company ties (e.g., developing close relationships with the CEO and other directors) and have built up substantial firm-specific human capital (Faleye, 2007). As a result, litigation risk may be only one of the many aspects of board service that an incumbent director considers when deciding whether to remain a board member.

In contrast, when a new candidate is deciding whether to join a board, he or she has less in-depth understanding of the company and fewer ties with the firm's officers and directors. Thus, a new director candidate is likely to give more weight to potential litigation risk. Second, whether a director is retained also depends on a director's performance. Directors who work to safeguard shareholder interests are more likely to be retained (Coles and Hoi, 2003); in contrast, directors who are named as defendants in shareholder litigation are more likely to depart (Fich and Shivdasani, 2007, Brochet and Srinivasan, 2014). Third, high-quality directors may leave the board for reasons unrelated to litigation risk such as to pursue better outside opportunities. Fourth, in recent years many boards have implemented limits on director age and the number of boards a director can serve on. Fifth, director turnover often occurs following CEO turnover since a new CEO often seeks to bring in new directors whom they know to replace some of the existing directors (Faleye, 2007).

3. Research design, sample selection, and summary statistics

3.1 Data and sample selection

UDs were adopted by 23 U.S. states on a staggered basis between 1989 (in Georgia and Michigan) and 2005 (in Rhode Island and South Dakota) as documented in Table 1. We identify as treatment firms all non-financial firms (SIC codes outside the 6000-6999 range in our sample period) incorporated in a state that adopted a UD. We obtain each firm's historical state of incorporation and headquarters state from EDGAR; and following Houston (2018) we backfill the missing data for earlier years with the first non-missing record reporting their incorporation or headquarters state.

We obtain financial statement data from Compustat and require our treatment firms to be incorporated in one of the 23 UD-adoption states and to have market capitalization data available from the year before UD adoption through the year after adoption. We drop firms that changed their

state of incorporation over the seven-year event window [-3, +3] straddling the law's adoption year (i.e., event year 0) because such re-incorporations to other states are endogenous decisions that can bias our analysis. We also drop firms without proxy statement filings available in years [-1, +1] from EDGAR, Thomson One, SEC Online (accessed via LexisNexis), or hard copies of SEC filings sourced from Thomson Reuters for years prior to the availability of EDGAR electronic filings.

Following Masulis and Mobbs (2011, 2014), we construct a matched control sample. This approach offers three advantages. First, it enables us to conduct a fixed-window analysis (three years) around the event year to minimize the influence of confounding factors that can arise over a long continuous sample period. Second, it helps mitigate concerns that treatment firms and control firms differ in important firm characteristics, and that these sample differences might drive any observed differential changes in outside director quality between treatment and control firms around these statutory changes. Third, using a matched control sample makes the workload associated with the intensive hand collection of individual director's biographic information more feasible.

Firm size is shown to be a good proxy for director reputation incentives (Knyazeva et al., 2013; Masulis and Mobbs, 2014) and shareholder litigation exhibits industry patterns (Lin et al., 2011). Thus, our control firms comprise one-to-one size (equity market value) matched firms incorporated in states that do not have a UD as of the end of the sample period and belong to the same Fama and French (FF) 49 industry in the year before UD adoption. Importantly, once a matched pair of treatment and control firms is formed in the year = -1, we follow this pair of firms through the event window [-3, +3] to obtain a panel data set that enables us to include firm fixed effects in a difference-in-differences framework. We impose the same data availability requirements on the control firms: the availability of proxy and financial statements for the event period [-1, +1] and the same state of incorporation over the event years [-3, +3]. Our final matched sample contains 375 treatment firms from the 23 states that adopted a UD, and their one-to-one industry-size-year matched control firms from other states without a UD.[13] For each treatment and control firm, we hand collect director

[13] Once a matched pair is found, we assign a pseudo-event year to the matched control firm and the pseudo-event year equals the event year of its corresponding treatment firm. Matching with replacement is allowed.

biographic information for up to three years before, and up to three years after the UD adoption year subject to proxy statement availability.

Directors can be divided into three categories, namely, firm insiders or executives (E), affiliated, grey or linked outsiders (L), and independent outsiders (I) based on the information provided for each director in the proxy statements. We focus on outside directors (both independent and linked) throughout our analysis for three reasons. First, unlike executive directors, outside directors are free to depart from the board because they are not company employees. We exclude executive directors from our analysis for this reason and because they serve at the pleasure of the CEO. Second, linked directors could provide valuable advisory services to the firm because they can be retired executives of the company, or executives of business suppliers/service providers and thus, they can bring in-depth knowledge and understanding of the firm and its industry to the boardroom. Third, most UDs were implemented before 2000 when there is no clear and consistent definition of independent directors in director disclosure requirements.[14]

Thus, given these considerations we include in our analysis both independent and linked director candidates who are nominated for election at the annual shareholder meetings. For non-classified boards, all board seats are up for election each year; for staggered boards, typically one third of the directors are up for election each year. We control for the percentage of linked directors in the firm-level regressions and employ an indicator for linked directors in the director-level regressions to account for the possibility that linked directors differ from independent director candidates in quality. As a robustness check, we also separately examine independent directors, and find broadly consistent results in this subsample of outside directors. Unless stated otherwise, directors will hereafter refer to nominated outside directors for simplicity.

3.2 Measures for the quality of outside director candidates

3.2.1 The director quality measures

Based on the information provided in director biographies disclosed in firm annual proxy statements, we focused on a broad list of ten director quality characteristics and divide them into

[14] Consistent with this view, we observe in our manual data collection process that firms at times regard linked outside directors as independent directors despite their discernible linkage (e.g., former employment, business relation) to the firm. We correct this misclassification when we find evidence in firm filings that a director is clearly not independent.

two major categories.[15] The characteristics in the first category capture an outside director's demonstrated management experience before nomination. The characteristics in the second category reflect an outside director's credentials - educational (i.e., degree) and professional (i.e., financial, legal, and industry) background.

For the experience measure, we employ five quality characteristics. The importance of the experience of director candidates is echoed by Tom Neff, Chairman of Spencer Stuart, who said in 2005 that "some of the most *experienced* board members are unavailable [after SOX]." Our first quality measure is whether an outside director is a key executive of another company before nomination (*Key_exec*), and this is also used in Bradley and Chen (2011) as a proxy for high quality. Following Knyazeva et al. (2013), we define a key executive as an executive holding one or more of the following management titles: chief executive officer (CEO), president, chairman, chief financial officer (CFO), chief information officer (CIO), chief operating officer (COO), vice president (VP), executive VP, senior VP, partner, managing director, or treasurer during a given year. To identify whether any of the above titles are currently held positions, we read each biography and manually code each item. Masulis and Mobbs (2014) use this executive position measure to capture a director's general managerial skills and experience.

Superior firm performance should reflect positively on director quality, and directors of such companies are often rewarded with more directorships in the labor market (Fama, 1980; Fama and Jensen, 1983). We therefore include an indicator denoting whether an outside director is from a public company exhibiting above industry median performance, measured by its return on assets (ROA) in the year before nomination (*HP_firm*). Industries are defined using the Fama-French (FF) 49 industry classification.

Innovation is vital to the development of a firm's core competitive advantage (Solow, 1957) and is a growth engine of a firm (Kang et al., 2018), and this is particularly true in today's knowledge-based economy. A firm's success in innovation should reflect positively on the quality of its directors, which we capture by an indicator variable for whether an outside director comes

[15] We find that in our data the principal component analysis tends to rotate the five experience related characteristics into one dimension and the other five credential related characteristics into a second dimension, suggesting that these ten characteristics do not belong to one category.

from a firm whose number of patent grants exceeds the industry median in the year prior to nomination (*HI_patents*). Patent data are obtained from Kogan et al. (2017), which cover all U.S. patents granted by the U.S. Patent and Trademark Office (USPTO) over the 1926-2010 period.

Another experience measure is whether an outside candidate is a director of an S&P 1500 company before nomination (*S&P 1500*). The variable takes the value of one if an outside director in the year before nomination is employed at a S&P 500 index firm, equals 2/3 if an outside director comes from a S&P midcap index firm, equals 1/3 if an outside director comes from a S&P small-cap index firm, in the year before nomination, and equals zero otherwise. Directors serving in large S&P 500 companies typically have more corporate connections and professional experience (Masulis and Mobbs, 2014). We also follow Bradley and Chen (2011) and use an indicator for outside directors holding more than one corporate board seat before nomination (*Multiple_seats*) as an experience measure, since they generally have more board experience.[16]

To account for educational background, we begin by focusing on the highest university degree held by an outside candidate (*Degree*), which equals one for a doctorate degree, 2/3 for a Master's degree, and 1/3 for a Bachelor degree. Given an MBA degree's importance to business education and firm management, we include a separate indicator variable to denote an outside director candidate with an MBA degree (*MBA*). Director financial and legal expertise has become more important after the enactment of SOX, which imposes a financial expertise requirement on boards (Linck et al., 2008). To capture a candidate's specialty, we include professional background indicators for whether an outside director has financial expertise (captured by a *Financial* indicator, which equals one if an outside director has a financial background (is/was a CFO, a treasurer, a banker, an accountant, an auditor, or a securities broker; or worked/is working in venture capital, private equity, or investment banking; or majored in finance or accounting at university), legal expertise (captured by a *Legal* indicator, which equals one if a director was/is an attorney, a legal counsel, a lawyer or majored in law), and same-industry expertise (captured by an *Industry* indicator,

[16] When counting total directorships, we include executive directorships. Our results remain similar if we use an alternative quality measure based on whether an outside director holds 1~3 board seats, and therefore, this multiple directorship measure does not simply capture busyness. Our results also hold if we drop *Multiple_seats* in constructing the *Experience* quality metric.

which equals one if an outside candidate is/was an executive or a director of a listed company in the same FF49 industry as the focal company). Wang et al. (2015) provides evidence that relevant industry expertise helps an outside director better monitor the firm in which she serves. Please see Appendix A for details of the variable definitions.

Following Ellul and Yerramilli (2013), Qin et al. (2018), Hoi et al. (2019), and Chen et al. (2020), we use the principal component analysis (PCA) to reduce the dimensionality of our director quality measures by transforming them into a much smaller number of dimensions, while still capturing most of their essential information. Specifically, we annually extract the first principal component of the first five director characteristics (i.e., *Key_exec, HP_firm, HI_patents, Multiple_seats, S&P 1500*) to capture director experience, and denote it by *Experience*. We use the first principal component of the remaining five director characteristics (i.e., *Degree, MBA, Financial, Legal, Industry*) to capture a director's educational and professional background, which we denote by *Educ & Prof Backg*. In robustness analysis, we show that our results are qualitatively insensitive to the use of a simple aggregation of the five binary component variables underlying each quality metric. This finding leads us to conclude that our results are not due to using PCA.

Panel A of Table 2 reports the means of the ten director characteristics and two first principal component-based composite quality metrics for nominated outside directors in each firm-year. The table also reports means of major firm characteristics. Note that we winsorize all the continuous control variables at the 1st and 99th percentiles.

3.2.2 Comparison of firm characteristics of treatment and control firms

We further examine the difference in firm characteristics of treatment and control firms in the year prior to a state's UD adoption. Table 2 Panel D reports the comparison results, and this evidence shows that there is no significant difference in any of the observed major firm characteristics or in the compensation outside director candidates expect to receive at the treatment and control firms. This suggests that the treatment firms and control firms are closely matched. In addition, the average year-to-year growth rates of the two director quality metrics are similar between treatment and control firms, consistent with the validity of the parallel trend assumption prior to UD adoption. Nevertheless, this assumption is more formally tested in Section 4.3.

3.3 Model specification

To test the effects of staggered state-level UD adoption on a firm's ability to recruit director talent, we follow Houston et al. (2018) and Appel (2019) and use a difference-in-differences (DiD) analysis:

$$Director\ quality_{iks,t} = \alpha + \beta UD_{s,t} + \gamma X_{iks,t-1} + \theta_i + \delta_{k,t} + \varepsilon_{iks,t} \qquad (1)$$

where $Director\ quality_{iks,t}$ is one of the two composite quality metrics (i.e., *Experience* or *Educ & Prof Backg*) of nominated outside directors at firm *i* incorporated in state *s* and headquartered in state *k* in year *t.* The main variable of interest is $UD_{s,t}$, an indicator that equals one if a firm's state of incorporation *s* has enacted a UD by year *t*, and zero otherwise. A positive and statistically significant β is consistent with the talent attraction hypothesis. Unlike studies relying on a single shock, a key advantage of using these staggered exogenous shocks (e.g., UD adoptions) is that they minimize the chance of an unobserved confounding shock coinciding with a single event year.

We include in the full model a set of control variables $X_{iks,t-1}$ measured in the year before the nomination year to mitigate any concern that treatment firms and their industry-size-year matched control firms differ in some other dimensions beyond the matching criteria variables. Specifically, *LnCashPay* is the natural logarithm of (annual cash retainer fee + the expected number of regular board meetings in a year × attendance fee per meeting for an outside director +1), which represents the cash-based pay that an outside director expects to receive if he or she attends all the regular board meetings. This pay measure is a conservative figure as we do not include the extra (often marginally higher) pay earned by serving on board committees or as a committee chair, or by attending any non-regular board meetings. We use this as our ex-ante measure of expected director compensation when a candidate is evaluating whether to join a board. We control for other compensation components by including *StkPay* (an indicator variable that equals one if a firm's outside directors receive equity-based compensation, e.g., restricted stock or stock option grants).

Outside candidates are predicted to be more likely to join boards of large and less risky firms. Thus, we control for firm size measured by the natural logarithm of market value (*LnMktVal*) and conventional firm risk measures including financial leverage (*Leverage*) and stock return volatility (*Stk volatility*), defined as the natural logarithm of the annual standard deviation of a firm's

percentage daily stock return. We also include the percentage of linked directors on the board (*Linked (%)*) to control for potential differences in the quality of outside linked directors versus independent directors.

In addition to firm-level controls, we include a set of fixed effects to absorb the influences of unobserved factors. θ_i represent firm fixed effects to control for unobserved firm-specific time-invariant factors. $\delta_{k,t}$ represent headquarters state-by-year fixed effects, which are used to control for any unobserved time-varying local economic trends in a firm's headquarters state (*k*) on director recruiting and retention.[17] Note that a state's UD governs all firms *incorporated* in that state and this is why headquarters state fixed effects can be included in the model. Inclusion of these multi-dimensional fixed effects allows us to conduct a sharper DiD test. We also cluster standard errors by state of incorporation *s* to account for potential correlations among firms incorporated in the same state due to common state laws, and the impacts of court rulings and state regulations.

In addition to our firm-level DiD analysis, we first conduct a similar DiD analysis at the director-level as a robustness check of the firm-year-level test of the talent attraction hypothesis. For this purpose, we estimate the following director-level model:

$$Director\ quality_{\ jiks,t} = \alpha + \beta UD_{s,t} + \gamma \Psi_{jiks,t-1} + \theta_i + \delta_{k,t} + \varepsilon_{jiks,t} \qquad (2)$$

where $Director\ quality_{\ jiks,t}$ is one of the two composite quality metrics *Experience* and *Educ & Prof Backg* for an outside director *j* nominated by firm *i* incorporated in state *s*, and headquartered in state *k* in year *t.* Ψ is a vector of firm-level and director-level control variables. In addition to the firm-level controls and a set of fixed effects used in Eq. (1), we also include two other director characteristics (*Age* and *Female*) to control for a firm's potential age and gender preferences in selecting outside directors, and an indicator for linked directors (*Linked*). The other variables are defined in Eq. (1). For the talent retention hypothesis, we need to conduct a *director-level* test because director retention or departure is largely an individual director-specific decision. We discuss the details of the model specification in Section 4.6.

[17] We do not further include industry-by-year fixed effects in the model, since the treatment firms and control firms have been exactly matched by Fama-French 49 industries.

4. Empirical results

4.1 Baseline results: Effects of UD adoption on talent attraction

4.1.1 Univariate DiD

Before we formally estimate our DiD regressions, we undertake a preliminary analysis of the data by conducting a univariate DiD in means. Specifically, we first compare the change in the mean quality of nominated outside directors from the Pre-UD adoption to Post-UD adoption period for treatment and control firms, respectively; we then compare the difference in the mean quality changes between the treatment and control groups. The results are reported in Panel A of Table 3. Comparing the Pre-event to Post-event periods, we see that the mean quality of outside directors in treatment firms experiences an improvement (0.114) when director quality is measured by the composite experience metric, and the change is also statistically significant at the 1% level. By contrast, the same change in the control group exhibits a smaller 0.035 coefficient, which is statistically insignificant. The difference in the mean change around UD adoptions between treatment and control groups is 0.079, which is statistically significant at the 10% level (t = 1.76). This preliminary result indicates that post-UD, treatment firms exhibit improved outside director experience relative to that of control firms.

When we measure outside director quality by the educational and professional background metric, we observe neither a significant improvement in the treatment group, nor in the control group. There is also no significant difference between treatment and control groups in terms of the pre-to-post UD adoption period mean change in the second composite director quality metric.

The evidence in the univariate DiD analysis indicates that any observed significant changes in director quality for treated versus control firms found in a regression-based DiD analysis is unlikely to be due to changes in director quality of control firms around UD adoption period. Nevertheless, a caveat about this univariate DiD analysis is that it does not control for year fixed effects or time-varying headquarters state fixed effects. Thus, we next present a formal regression-based DiD analysis where we control for state-by-year fixed effects to capture potential confounding effects of unobserved shocks unique to each headquarters state and year. Note that controlling for state-by-year fixed effects is more stringent than simply controlling for year fixed effects.

4.1.2 Regression DiD

We estimate Eq. (1) and test how outside director quality changes after a UD adoption. The results are reported in Panel B of Table 3. Columns (1) and (2) employ *Experience* as the director quality metric, while Columns (3) and (4) employ *Educ & Prof Backg* as the quality metric. While Columns (1) and (3) contain no firm-level control variables, Columns (2) and (4) include controls for a number of major firm characteristics that are lagged by one year relative to the dependent variable, except for *Linked (%)* that is measured contemporaneously to capture the potential difference in the quality of linked and independent outside directors.

The results reported in Columns (1) and (2) show that UD adoptions, which substantially reduce the incidence of shareholder derivative suits, lead to a statistically significant improvement in nominated outside directors based on the experience quality metric. The result is consistent with the univariate DiD findings. The point estimate of 0.151 for *UD* in Column (1) is about 14% of the standard deviation of this director quality metric, which represents a clear improvement in director quality. This represents our first piece of causal evidence that greater director litigation protections help a company attract more capable outside candidates with better experience. To the best of our knowledge, this is the first evidence in the literature to report support for the talent attraction hypothesis (H1) for U.S. directors.

Interestingly, Columns (3) and (4) show that the significant improvement in director quality does not carry over to directors' educational, financial, legal, and industry backgrounds. One possible explanation is that candidates with stronger experience are more sensitive to litigation risk because of their greater reputation capital exposure. It is also possible that more experienced directors are harder to recruit due to their limited supply, while candidates with other credentials (degrees, financial, legal and industry background) are in greater supply.

4.2 Verifying the parallel-trend assumption

The results of our baseline DiD analysis can only be interpreted as causal if UD adoption is exogenous. A potential concern is that UD adoption could be a result of lobbying by some firms. For example, firms having difficulty recruiting high caliber directors might lobby their state legislature to pass a UD statute to reduce director exposure to shareholder derivative suits (hereafter,

this behavior is termed the political economy hypothesis). However, several studies of UDs (e.g., Houston et al., 2018; Appel, 2019; Lin et al., 2020) and our test reported in Appendix B suggest that UD adoption is unlikely to be the result of corporate lobbying. Specifically, in Appendix B, we follow Lin et al. (2020) to estimate a Weibull hazard model of the time needed (in years) until UD adoption and show that a state's two lagged average outside director quality metrics for firms incorporated in the state are unrelated to the speed of the state's UD adoption. Nevertheless, to further rule out the political economy hypothesis, we conduct two more tests as discussed below.

First, we conduct a dynamic DiD analysis specified in Eq. (3) below (with a model setup closely following Bertrand and Mullainathan (2003)):

$$\begin{aligned} Director\ quality_{iks,t} &= \alpha + \beta_1 UD(-1)_{s,t} + \beta_2 UD(0)_{s,t} + \beta_3 UD(+1)_{s,t} \\ &+ \beta_4 UD(+2)_{s,t} + \beta_5 UD(+3)_{s,t} + \gamma X_{iks,t-1} + \theta_i + \delta_{k,t} + \varepsilon_{iks,t} \end{aligned} \quad (3)$$

where we break the indicator variable *UD* in Eq. (1) into a series of indicator variables reflecting the event time dynamics relative to each state's UD adoption year (i.e., year 0). Specifically, we use $UD(-1)_{s,t}$, $UD(0)_{s,t}$, and $UD(+1)_{s,t}$ as indicator variables for the year immediately prior to, the adoption year, and the year following adoption, respectively. Likewise, $UD(+2)_{s,t}$ and $UD(+3)_{s,t}$ are indicator variables that equal one if firm *i*'s state of incorporation *s* adopts a UD statute two and three years ago, respectively. Other control variables are identical to those in Eq. (1). This analysis enables us to assess whether observed improvements in the quality of outside directors in treatment relative to control firms occurred prior to UD adoptions (and if so, our finding could be capturing a pre-existing trend).

According to Bertrand and Mullainathan (2003), an insignificant coefficient on $UD(-1)_{s,t}$ would support the validity of the parallel trend assumption for treatment and control firms before a UD adoption. We find the coefficient of $UD(-1)_{s,t}$ is not statistically significant in any of the models reported in Table 4. These results are consistent with the existence of a parallel trend in the quality of outside directors in the treatment and control firms prior to UD adoption. It also confirms the similar growth rates in director quality measures between treatment and control firms as seen in Panel B of Table 2. In addition, the coefficients of $UD(0)_{s,t}$, $UD(+1)_{s,t}$, $UD(+2)_{s,t}$ and

$UD(+3)_{s,t}$ are consistently positive and significant in Columns (1) and (2), suggesting that the quality of nominated outside directors improves from the UD adoption year, and the improvement persists thereafter. A graphical presentation of the dynamic treatment effects of UD adoptions on the quality of outside directors is shown in Figure 1. Unlike many ex-post business decisions, the recruitment and retention of high-quality directors can be implemented relatively quickly, and therefore, a change in board composition can be observed almost immediately as long as UD adoption significantly raises high-quality candidates' willingness to serve.

Second, unlike the remainder of the UD adoption sample, Pennsylvania is unique in that it did not adopt UD through the passage of a statute by the state legislature, but rather as a result of a Pennsylvania Supreme Court ruling in *Cuker v. Mikalauskas* (1997). The impartiality and apolitical nature of the court ruling ensures that UD adoption in Pennsylvania was not due to corporate lobbying. In the test reported in Table 5, we include only firms incorporated in Pennsylvania as treatment firms along with their matched control firms. Following the court ruling ushering in UD within Pennsylvania, the quality of outside directors, measured by the experience metric, significantly improves for Pennsylvania-incorporated firms relative to their one-to-one industry-size-year matched control firms. It is noteworthy that we also observe a significant improvement in director quality for this subsample when it is alternatively measured by the director educational and professional background metric. Overall, we conclude that our baseline findings are not driven by firms that could benefit from successfully lobbying their state legislature to pass a UD.

4.3 Robustness of the results

In this section, we conduct additional sensitivity tests to check the robustness of our key finding regarding the improvement in the quality of nominated outside directors, and then consider the credibility of some alternative interpretations of our results.

4.3.1 Robustness analysis for multiple-hypotheses testing

Reusing an experimental setting for many different dependent variables could increase the likelihood of Type I errors (i.e., false positives) (Jones et al., 2019; Heath et al., 2020). Several recent studies (Houtson et al., 2018; Bourveau et al., 2018; Nguyen et al., 2018; Ni and Yin, 2018; Appel, 2019; Chu and Zhao, 2020; Le et al., 2020; Lin et al., 2020; Nguyen et al., 2020) have used

the UD law setting to investigate the influence of litigation risk. Therefore, some researchers might argue that our study is subject to potential understatement of Type-I errors.

To address this concern, we follow Jones et al. (2019) and Heath et al. (2020) to conduct multiple hypothesis testing when reusing the UD law setting. The key to this test is the use of the Westfall and Young's (1993) free step-down resampling procedure to control for the family-wise error rate (FWER) (i.e., the probability of incorrectly rejecting one or more null hypotheses belonging to a family of hypotheses). In this test, we define a family of hypotheses that encompass 11 outcome variables. We calculate the eleven main outcome variables used in the above cited UD studies for our sample period (from 1986 to 2008). Following the free step-down resampling procedure in Westfall and Young (1993), we employ firm-level clustered bootstrap resampling using 1,000 repetitions. We then repeat our DiD analysis for each dependent variable in each bootstrap sample and calculate their adjusted *p*-values.

The multiple-hypothesis testing results are reported in Table 6. We find that the experience of outside directors improves following the adoption of UD laws, while the educational and professional backgrounds of outside directors remain similar following the adoption of UD laws. These findings are consistent with our baseline findings. We conclude that our key findings are not the result of false positives arising from the reuse of the UD law setting.

4.3.2 Results from using matched pair firms with close headquarters-state distance

Thus far, we find a significant improvement in the quality of nominated outside directors for firms incorporated in UD-states, where director quality is measured by the experience metric relative to industry-size-year matched control firms incorporated in non-UD states. We previously include headquarters state-by-year fixed effects to control for potential confounding effects of unobserved shocks to a firm headquarters state's economic environment. As an alternative approach to controlling for potentially confounding effects of differences in state environments, such as varying supplies of local directors or the quality of the local business environment, we further require industry-size-year matched control firms to be headquartered in a close geographical proximity to the corresponding treated firms.

This approach of using nearby control firms strengthens our identification since treatment and control firms are subject to the same or very similar economic environments and cultural influences, with the difference between treatment and control firms primarily reflecting different corporate legal codes that shape the level of litigation risk faced by outside directors. If we continue to find robust results, then we have greater confidence that the difference in director liability protections (which are shaped by the law in a firm's state of incorporation) is responsible for our findings.

Following Knyazeva et al. (2013), we use the latitude and longitude information of treatment firms and their matched control firms' headquarters in the event year to calculate the distance between the paired firms' headquarters states.[18] We define a proximate firm pair to include a treatment firm and the corresponding matched control firm that have a headquarters-state distance within 60 (or 100) miles, which approximately represent the 5th and 10th percentiles of the distribution of headquarters-state pairs' distances in our sample. While imposing this stricter matching criterion significantly reduces the sample size, the baseline DiD results reported in Panels A and C of Table 7 are qualitatively similar to those reported in Table 3. Panels B and D also show that the matched pairs of treatment and control firms have statistically similar headquarters state characteristics. These results lend further support for our baseline results on UD adoptions.

4.3.3 Controlling for confounding antitakeover laws

Several forms of state antitakeover laws were adopted in the period between 1980 and 2010 that overlap with UD adoptions in some of the same states. Thus, another potential concern is that our documented changes in outside director quality are caused by the adoption of state antitakeover statutes. We follow Karpoff and Wittry (2018) to control for confounding effects of several forms of state antitakeover laws including business combination (*BC*), director duties (*DD*), control share acquisition (*CSA*), fair price (*FP*), and poison pill (*PP*) statutes. $BC_{s,t}$ equals one if state *s* in which a firm is incorporated passed a BC law by year *t*, and it equals zero otherwise. *DD, CSA, FP*, and *PP* are defined analogously. *AT statutes* is a simple aggregate index of the five statute indicators, namely *DD, CSA, BC, FP* and *PP*. The results are reported in the Panel A of Table IA1 of Internet

[18] The latitude and longitude information of a firm's business address is obtained from the data compiled by Prof. Bill McDonald, and is available since 1994. Among our 331 pair-firms, 208 pair-firms have available headquarters state distance data for the event year (other events occur too early to have data available for the matched firms).

Appendix, where we find the effect of UD adoption remains qualitatively unchanged under these specifications. When we control for the five antitakeover statute indicators separately in unreported results, we also find qualitatively similar results.

4.3.4 Are the results due to the 2008 financial crisis?

The last year of our sample period coincides with the 2008 financial crisis. In this period, stock crash risk rose dramatically, and so did a firm's likelihood of becoming a target of shareholder litigation. In effect, the financial crisis raised the litigation risk that directors faced and made it more difficult for firms to recruit high-quality candidates, which predicts just the opposite effect to our empirical findings. Nevertheless, when we drop year 2008 from our analysis, our results remain qualitatively unchanged as shown in the Panel B of Table IA1 of Internet Appendix. Thus, we conclude that the 2008 financial crisis is unlikely to be responsible for our findings.

4.3.5 Are the results due to SOX and the associated exchange listing rule changes?

The Sarbanes-Oxley Act (SOX) became law on July 30, 2002 and it placed new requirements on boards of U.S. listed companies. Linck et al. (2008) find that the effects of SOX and the ensuing new NYSE and NASDAQ listing rules requiring a majority of independent directors are two-fold: on one hand, it reduces director supply by increasing director workload and liability risk; on the other hand, it increases corporate demand for directors by requiring many listed firms to recruit added independent directors, which makes the recruiting of high caliber directors more difficult.[19] Therefore, SOX and the new listing requirements have the effect of *increasing* director liability for both treatment and control firms, which is opposite to the effect of UD adoptions.

Nevertheless, we perform two tests in Table IA2 of Internet Appendix to further mitigate the concern about the potential confounding effects of SOX. In Panel A, we use all UD adoption events, but we partially control for the effect of exchange listing rules regarding board independence by including the lagged percentage of independent directors in our baseline DiD model. The rationale is that firms with less independent boards are more affected by the 2002 regulatory changes regarding board independence. In Panel B, we provide a sharper test by only including UD

[19] The governance proposals of the NYSE and NASDAQ, referred to as Public Law 107-204, were issued on July 30, 2002, and mandated firms to have more than 50% of independent directors on their boards.

adoptions that occurred no later than 1998 and these events are clearly not affected by SOX and the associated new exchange listing rules on board independence or the anticipation of these changes. In both tests, our results remain qualitatively the same. Thus, we conclude that the exchange listing rule changes are unlikely to be responsible for our findings.

4.3.6 Effects of UD adoptions on the attraction of talented directors (director-year-level analysis)

Our talent attraction analysis thus far is at the firm-year level. In this section, we conduct a director-year-level analysis to check the robustness of our results. To this end, we estimate Eq. (2) with additional director characteristics (e.g., indicators for over 65 years old and gender) beyond the firm-level control variables in Eq. (1) to further test how outside director quality changes after UD adoption. We replace firm-level director quality measures with their corresponding director-level equivalents and use them as dependent variables. Our regression sample contains nominated outside directors for each firm-year. The results reported in Table IA3 of Internet Appendix are consistent with the previous findings based on our firm-year-level analysis reported in Table 3. Moreover, the size of the director quality improvement based on the director experience metric is comparable to the results in Table 3 based on a firm-year-level analysis.

4.3.7 Results from examining independent directors

Our analysis thus far has focused on all outside directors. In this section, we rerun the baseline and dynamic DiD regressions for independent directors only. As we discuss in Section 3.1, most of the UD adoption events occurred before 2000 when there was no consistent or standard definition of independent directors, which adds noise to the classification of independent directors. Bearing this caveat in mind, we repeat our baseline DiD analysis using independent directors and the results are reported in Table IA4 of Internet Appendix.

The results suggest that after UD adoptions, the experience metric of independent directors in treatment firms exhibits a significant improvement relative to that of the matched control firms at the 95% confidence level. In contrast, independent directors in treatment firms exhibit no significant improvement in their educational and professional background metric, which is broadly in line with our earlier results examining all outside directors.

4.3.8 Are the results robust to a simple aggregation of director quality items?

Our analysis thus far uses the first principal component of the five quality characteristics reflecting either director experience or alternatively director educational and professional background. The results reported in Table IA5 of Internet Appendix show that our key results on the improvement in the outside director experience metric are robust to using a simple aggregation of the five respective binary quality variables. Notably, we also find some evidence of improvement in outside directors' educational and professional background metric, when we take this approach.

4.4 Do firms affected by UDs attract more high-quality directors from other states?

While we have shown that UD adoptions help firms recruit outside directors with more experience. A related question is where these high caliber candidates come from. If concerns about litigation risk previously deterred high-quality director candidates from serving on corporate boards, then we could expect to see a rise in the proportion of high caliber outside directors recruited from states that never passed a UD. To investigate whether this is true, we calculate the proportion of nominated outside directors who come from a firm incorporated in a non-UD state,[20] while their *Experience* quality metric (or *Educ & Prof Backg* quality metric) is in the top tercile of the director sample's distribution. We then use this as the dependent variable and repeat our DiD estimation. The results are reported in Table 8.

The DiD results reported in Columns (1) and (2) show a positive and statistically significant coefficient on *UD* when director quality is measured by the composite experience metric. Thus, UD adoptions appear to make high-quality director candidates from non-UD states more willing to serve at firms incorporated in UD states. This result further corroborates the findings regarding the talent attraction hypothesis. In Columns (3) and (4), we measure the quality of outside directors by the educational and professional background metric, and we also find evidence that UD adoptions attract high-quality candidates from non-UD states to join the boards of treatment firms in UD states.

4.5 Heterogeneity in the effects of UD adoptions on talent attraction

4.5.1 Do firms facing higher pre-event litigation risk benefit more from UD adoptions?

[20] The nominated candidate can be a current director or an active executive of a firm incorporated in a state without a UD, and does not need to quit his/her current position after being nominated to the board of a firm incorporated in a state that passed a UD.

Our baseline finding is consistent with litigation risk impeding the successful recruitment of high caliber outside director candidates. To provide more direct evidence on the litigation risk channel, we conduct a difference-in-difference-in-differences (DDD) analysis. This analysis tests whether director quality improvement following UD adoptions is more pronounced in firms that face higher litigation risk (and hence should experience greater difficulty in attracting talented outside candidates).

We first measure a firm's pre-event litigation risk by the frequency of M&A deals. The reasoning behind this approach is that M&A-related lawsuits are the principal litigation risk faced by directors in fiduciary duty lawsuits (Thompson and Thomas, 2004; Lin et al., 2011). Shareholders can bring both direct class actions and derivative suits to challenge M&A deals under state corporation law (Thompson and Thomas, 2004; Krishnan et al., 2012; Chu and Zhao, 2020).[21] Chu and Zhao (2020) report that 23% of shareholder lawsuits targeting M&A transactions that are filed in federal courts between 2000 and 2012 are derivative suits. A limitation of this M&A-based litigation risk measure is that it measures the risk of not only derivative suits, but also class action suits. Thus, we also use the total number of derivative suits in the firm's Fama-French 49 industry as an alternative measure of the probability of a firm within the same industry being targeted by a derivative suit. The data on derivative suits are obtained from the Audit Analytics database and the earliest shareholder derivative suit it records starts in 1996.

We use a cohort-based DDD approach. The sample construction for this test is as follows. Each UD adoption year constitutes a cohort year, and all firms incorporated in the UD adopting states involved in the cohort are classified as treatment firms in that cohort. For each treatment firm involved in a cohort year, we take its yearly observations over the event window [-3, +3] and then take similar observations over the same [-3, +3] time period for its industry-size matched control firm following the same procedure described in section 3.1. We repeat this sampling procedure for all other UD adoption event years (cohorts) and then pool observations from all UD adoption event years to form the final sample used in our DDD analysis. Since this procedure can result in repeated

[21] See Krishnan et al. (2012) for evidence on how shareholders use class actions to police low-ball bids and force offer price improvement.

observations of the same matched control firms across cohorts, we control for higher-order cohort-based fixed effects. Specifically, we replace firm fixed effects in the baseline model with two-way firm-cohort fixed effects and replace headquarters state-year fixed effects with three-way headquarters state-year-cohort fixed effects. This is a conservative approach because it allows the fixed effects to vary by cohorts, rather than forcing them to be the same across cohorts.

Both litigation risk measures are defined in the year *before* UD adoption to avoid any feedback effects from the UD adoptions (and for the same reason, the partitioning variables used in other interaction tests in this section are measured in the year before UD adoptions). We use inverse indicators of litigation risk so that the coefficient on *UD* can be conveniently interpreted to reflect the effect of UD adoptions on the quality of outside directors in firms that are subject to *higher* litigation risk – the focus of the heterogeneity tests. Specifically, *Low M&A* (activity) is an indicator variable that equals one if a firm's total number of completed M&A deals is in the bottom tercile of the sample distribution. *Low derivative suit risk* is an indicator variable that equals one if the total number of derivative suits that occurred in a firm's Fama-French 49 industry is within the bottom tercile of the sample distribution. We then interact each of the above indicators with the *UD* indicator. If UD adoptions improve outside director quality through the litigation risk channel, then we expect the *UD* coefficient to be positive and statistically significant, and the coefficients of the interaction terms *UD* × *Low M&A* and *UD* × *Low derivative suit risk* to be significantly negative.

The results of the DDD analysis are reported in Table 9.[22] In Columns (1) and (2) of Panel A, the coefficients on *UD* are positive and statistically significant at the 1% level, with the magnitude of the coefficients doubling the coefficient estimates in the baseline results reported in the Column (2) of Table 3 Panel B. This indicates that firms engaged in more M&A deals or that operate in an industry more frequently targeted by shareholder derivative suits (and hence facing higher litigation risk) experience a larger increase in outside director quality in the post-adoption period. Also, the benefit of director protections afforded by UD adoptions is less pronounced for firms that face lower litigation risk as indicated by the negative coefficients of the interaction terms, *UD* × *Low M&A*

[22] Note that $UD_{s,t}$ can be conceptually understood as $Treat_s \times Post_t$.

and *UD* × *Low derivative suit risk*, which are statistically significant at the 5% and 10% level, respectively. These results indicate that firms facing higher (lower) litigation risk, which should raise (reduce) the difficulty in attracting high caliber outside candidates (measured by the director experience metric), should stand to benefit more (less) from UD protection. Thus, our DDD evidence on the litigation risk channel supports the DiD results reported in Table 3. Note that even for firms facing lower litigation risk, the quality of nominated outside directors improves as indicated by the statistical significance of ($\beta_1 + \beta_2$) reported in the lower section of Panel A.[23]

In Panel B, we measure director quality by their educational and professional backgrounds. The *UD* coefficient is positive and statistically significant at the 5% level in Column (2), suggesting that treatment firms operating in industries that face higher risk of derivative suits also experience a significant improvement in the quality of outside directors as measured by the educational and professional backgrounds. Similar to the M&A frequency results, the coefficient on the interaction term (β_2) is negative (albeit statistically insignificant in Columns (1) and (2)).

High-technology firms typically have substantially more growth opportunities, which requires them to make large risky R&D investments with highly uncertain outcomes and a high probability of failure (Kang et al., 2018). As a consequence, these firms can face higher litigation risk due to higher stock return volatilities or a higher probability of investments going bad (Guan et al., 2019). Such firms may need more litigation protection to successfully recruit high-quality directors, who are better able to make the risky investment decisions required to exploit these growth opportunities (Guan et al., 2019; Lin et al., 2020). To test this proposition, we follow Barron et al. (2002) in defining high-technology companies as firms in the following three-digit SIC industries: 283 (Drugs), 284 (Chemicals), 357 (Computer and Office Equipment), 366 (Communications Equipment), 367 (Electronics), 371 (Motor Vehicles), 382 (Measurement and Control Devices), 384 (Medical Instruments), and 737 (Software). The remaining industries are deemed to be non-high technology and firms in these industries are captured by an indicator variable (*Non-Hi tech*), which

[23] A caveat is that the test in Column (2) uses a reduced sample size because the Audit Analytics database only covers derivative litigation data starting in 1996.

equals one if a firm's three-digit SIC code is not in the above high-technology industries category in the year before UD adoption and equals zero otherwise.

To test whether boards in high-technology firms benefit more from UD adoptions, we examine the *Non-Hi tech* indicator variable and its interaction with the *UD* indicator variable to test for a differential effect of UD adoptions (if any) on the quality of nominated outside directors. The results are reported in Table IA6 of Internet Appendix. When director quality is measured by the experience metric, the coefficients on *UD* (β_1) are positive and statistically significant, and the interaction terms (β_2) have negative and statistically significant coefficients, while the sum of the coefficients of ($\beta_1 + \beta_2$) denoting the change in the quality of outside directors in *Non-Hi tech* firms are also positive and significant. Therefore, while all treatment firms are able to recruit better outside directors after UD adoptions, the effect is stronger for high-technology companies. When we measure director quality by educational and professional background, there is no such evidence, which is broadly consistent with the baseline findings in Table 3.

Taken together, we find support for the view that the improvement in the quality of outside directors following UD adoption is more pronounced in firms that face higher litigation risk before its adoption (and hence they face greater difficulty in attracting talented outside candidates), particularly when measuring director quality using the experience metric.

4.5.2 Does the effect of UD protections vary with existing firm-level protections?

Firms often have liability-limiting provisions (LLPs) specified in a firm's charters/bylaws to the extent permitted by state laws prior to their incorporation state's adoption of a UD.[24] It is therefore interesting to examine whether the effect of UD protections on director recruiting varies with the prior level of LLP protection.

Following Bradley and Chen (2011), we look at three items from the G-index as measures of firm-level director protections: the director indemnification provision (*Dir ind*), the director liability limitation provision (*Dir liab*), and indemnification contracts (*Dir indc*) in corporate

[24]Almost every U.S. listed firm carries D&O insurance (details are not publicly available) and there is no reason to believe firm purchases of D&O insurance change significantly around UD adoptions. Any change is likely to reduce D&O insurance coverage because directors face lower litigation risk following the passage of a UD, and such a reduction in D&O coverage (if any) should bias against our finding an improvement in the quality of outside directors.

charters/bylaws when allowed by state laws. We define an index of LLP protections (*LLP protection index*) as the sum of these three LLP items. A higher value of the LLP protection index indicates more director liability protections. We include in the model an interaction term *UD* × *LLP protection index* to test whether the effect of UD protections on director recruiting varies with existing LLP protections. Note that only S&P 1500 firms have LLP protection data available for the tests. The results are reported in Column (3) of Table 9, Panels A and B.

The coefficient of *UD* is positive and significant at the 5% level in Column (3) of Panel A when director quality is measured by the director experience metric. This coefficient indicates that firms without LLP protections experience a significant improvement in director quality after UD adoption. The interaction coefficient *UD* × *LLP protection index* is negative (albeit insignificant) in Column (3) of Panel A. The positive and significant combined coefficient of ($\beta_1 + \beta_2$*Mean LLP) suggests that the effect of UD protection on outside director quality holds even when firm-level LLP protections exist at the mean level.[25] The result also suggests that legal protection afforded by a UD statute is distinct because it reduces the incidence of shareholder derivative suits. In contrast, LLP protections have no such effect, but instead limit the size of director liability in the event of a derivative suit. This may explain why 23 states passed a UD to provide additional director liability protection, even though most firms incorporated in those states had previously adopted some liability protections for directors in their corporate charters/bylaws.

When director quality is measured by the educational and professional background metric in Column (3) of Panel B, the *UD* coefficient (that measures the UD effect in firms without LLP protections) and the interaction term coefficient are insignificant. These results are consistent with our baseline findings that show a lack of a significant improvement in outside director educational and professional background in the full sample following UD adoptions as shown in Table 3.

4.5.3 Do firms with a smaller local director pool benefit more from UD adoptions?

Knyazeva et al. (2013) show that the size of the local pool of director candidates directly affects the likelihood of independent director appointments. This suggests that the effect of UD adoptions

[25] If we alternatively measure LLP protection by an LLP-indicator variable that equals one if a firm has any of the three LLP features as of the year before UD adoption, the results are qualitatively similar.

on director recruiting is likely to vary with the size of the local pool of director candidates. To test this, we follow Knyazeva et al. (2013) and measure the size of the local supply of director talent as the number of non-financial S&P 1500 firms whose business addresses are within 60 miles (approximately 100 kilometers) of a firm's headquarters, excluding firms in the same 4-digit SIC industry (that are likely competitors of the focal firm, whose executives are unlikely to be serious director candidates due to these competitive concerns).

Large local pool is an indicator variable that equals one if a firm's local pool of director candidates is in the top tercile of the sample. Since it is easier for firms surrounded by a larger local pool of director talent to recruit high-quality directors, it follows that the passage of a UD is less likely to have as strong an effect on director recruiting at these firms. Thus, we expect the interaction coefficient *UD* × *Large local pool* to be significantly negative. Knyazeva et al. (2013) also argue that the largest firms in the market are not constrained by local director pool in recruiting directors We therefore exclude from our analysis firms whose equity market capitalization is above the 90th percentile of the sample distribution in the year before UD adoption.

The results of the above test are reported in Column (4) of Table 9 Panels A and B. In Column (4) of Panel A, the *UD* coefficient is positive and significant at the 1% level when quality is measured by the director experience metric. This indicates that firms facing a smaller local pool of director talent experience a significant improvement in director quality after UD adoptions. The coefficient of *UD* × *Large local pool* is negative and significant at the 5% level and the test of the combined coefficient ($\beta_1 + \beta_2$) is statistically insignificant, suggesting that the beneficial effect of UD adoptions on recruiting of outside directors with more experience does not exist for firms with a large local pool of director candidates. These results are broadly consistent with the finding of Knyazeva et al. (2013) on the important role that the local supply of director candidates plays in corporate board composition.

When quality is measured by the director educational and professional background metric, we find in Column (4) of Table 9 Panel B, that the coefficient of *UD* is positive and significant at the 5% level, suggesting that firms facing a smaller local pool of director talent also experience a significant improvement in director educational and professional background after UD adoptions.

The interaction term coefficient *UD* × *Large local* pool, however, is statistically insignificant, suggesting that the recruiting of outside directors with better educational and professional background after UD adoptions does not significantly vary across local director pools. We conjecture that this could be because such directors are more widely available than experienced directors. Taken together, we find evidence that UD adoption is more beneficial for firms with smaller pools of director candidates when quality is measured by experience.

4.6 Effects of UD adoptions on the retention of talented directors

In this section, we test the talent retention hypothesis – i.e., whether director protections afforded by UD adoptions help a firm retain high-quality outside directors (H2). Since whether an outside director departs from a board is largely an individual decision, we perform the test of the talent retention hypothesis at the director-year level using the following model:

$$\begin{aligned} Voluntary\ departure_{\ jiks,t+1} &= \alpha + \beta_1 UD_{s,t} + \beta_2 Low\ quality_{\ jiks,t} \times UD_{s,t} \\ &+ \beta_3 Treat_s \times Low\ quality_{\ jiks,t} \\ &+ \beta_4 Post_t \times Low\ quality_{\ jiks,t} + \beta_5 Low\ quality_{\ jiks,t} \\ &+ \gamma X'_{jiks,t} + \theta_i + \delta_{k,t} + \varepsilon_{jiks,t} \end{aligned} \quad (4)$$

where the dependent variable, $Voluntary\ departure_{\ jiks,t+1}$, equals one if an incumbent outside director *j* of firm *i* incorporated in state *s* and headquartered in state *k* leaves the board in year *t*+1 for voluntary reasons. Voluntary departures do not include "reach the maximum tenure period", "died", "sick", "departure due to the violation of law", or "accept a position in the government".[26] $UD_{s,t}$ (i.e., $Treat_s \times Post_t$) is an indicator variable that equals one if state *s* where the firm is incorporated has passed a UD by year *t*, and zero otherwise.

Estimating the Eq. (4) regression allows us to test whether a UD adoption leads to a change in the probability of a high-quality outside director's voluntary departure, as captured by the coefficient estimate of *UD* (β_1). We estimate a linear probability model with various fixed effects to avoid the incidental coefficient estimate problem when including a large number of fixed effects in a non-linear Probit model (Wooldridge, 2010). The talent retention hypothesis predicts a negative

[26] Our results remain similar if we categorize "accept a position in the government" as a voluntary departure reason.

and statistically significant coefficient of β_1. $Low\ quality_{\ jiks,t}$ is an indicator variable that equals one if the value of an outside director's composite quality metric (i.e., *Experience* or *Educ & Prof Backg*) is below the top tercile of the sample distribution in year *t*. The combined coefficient of $(\beta_1 + \beta_2)$ captures the probability of a voluntary departure by low-quality outside directors.

In the following test, we include two more director level controls. First, we add an indicator for an outside director's with poor meeting attendance in the past year as a rough proxy for his/her performance. The indicator *Attendance<75% (0/1)* equals one if an outside director has attended less than 75% of firm board meetings in the past year and zero otherwise. Second, we control for the proportion of firm shares held by an incumbent outside director (*DirOwn*). As ownership in the firm rises, a director's incentives to voluntarily depart should decline. The other variables are the same as in Eqs. (1) and (2). Similarly, we use a cohort-based DiD analysis and include cohort-based fixed-effects to deal with repetition in some of the control firms. Since firms with a classified board elect only 1/3 of directors each year, this feature could confound the test of the talent retention hypothesis. Thus, we limit our analysis to non-classified boards for a cleaner test of the talent retention hypothesis.

The results of this analysis are reported in Table 10. We find that the *UD* coefficient is negative and statistically significant at the 10% level or better in both Columns (1) - (2) when director quality is measured by the *Experience* metric and in Columns (3) - (4) when director quality is measured by the *Educ & Prof Backg* metric. These results suggest that UD adoptions lower the likelihood of voluntary departures of high-quality outside directors by approximately 7% as indicated by the coefficients reported in Columns (2) and (4). The coefficient of *UD* × *Low quality* is insignificant, suggesting that UD adoptions do not differentially affect the turnover of high-quality outside directors more than low-quality outside directors. In fact, like high-quality outside directors, the turnover rate of low-quality outside directors also drops significantly as indicated by the negative and statistically significant sum of coefficients of $(\beta_1 + \beta_2)$ reported near the bottom of Table 10. The coefficients of the indicator variable *Attendance<75% (0/1)* are positive, suggesting that weak director meeting attendance tends to increase a director's departure rate in the next period, although the relation is not statistically significant. Also, outside directors holding a higher proportion of firm

shares are less likely to leave as suggested by the negative (albeit insignificant) coefficients on *DirOwn*. Overall, we find some limited support for the talent retention hypothesis.

As pointed out by Faleye (2007), director retention determinants are more complex than factors affecting a director's initial decision to join a board. For example, other than litigation risk, the relationships a director has developed with the CEO and other directors, a director's understanding of and affinity to a firm's culture, and a director's outside opportunities, as well as board changes after a CEO turnover can affect a director's retention outcome. In particular, a high-quality director should have better outside options (e.g., more invitations to join boards of larger firms), and so they may have a higher chance of leaving a board than other outside directors. This adds tension to the talent retention hypothesis. In contrast, when a candidate first decides whether to join a board, these factors have less influence given a candidate's weaker links to the board and limited knowledge of the firm. Thus, non-incumbent candidates are likely to give more weight to potential litigation risk. This could explain why we find stronger support for the talent attraction hypothesis.[27]

4.7 Alternative explanations

4.7.1 Can our main results be due to a change in director compensation policy?

Another possible concern with our finding of an improvement in outside director quality following UD adoptions is that firms could pay higher compensation to outside directors after UD adoptions. This concern, however, is unlikely to drive our findings since Aguir et al. (2014) find that director litigation protections and compensation tend to be substitutes. To the extent that a UD law increases director protections, firms should be able to pay *lower* rather than higher compensation. Nevertheless, we test whether there is a change in the way firms remunerate their outside directors around UD adoptions. We use two measures of director compensation in our tests, namely, *LnCashPay* and *StkPay*. *LnCashPay* represents the total annual cash compensation that an outside director candidate expects to receive (see discussion in Section 3.3). *StkPay* is an indicator

[27] In unreported analysis, we find when we interact *UD* with low-litigation-risk measures (having fewer M&A deals or firms operating in industries that experience fewer derivative suits before UD adoption as in Table 9) to investigate whether the change in the voluntary departure rate of high-quality outside directors around UD adoptions varies with the pre-event level of a firm's litigation risk, we find that the interaction term coefficients are not statistically significant.

variable that equals one if a firm grants equity-based compensation (stock and/or options) to its outside directors.

The results of this analysis are reported in Table 11. They show that companies do not significantly change the way they compensate outside directors around UD adoptions. This evidence indicates that our finding of an increase in outside director quality around UD adoptions is unlikely to be driven by a rise in director compensation.

4.7.2 Can our results be due to a higher demand for high-quality directors?

While we interpret our finding of an improvement in outside director quality around UD adoptions as primarily reflecting an improved supply of high-quality directors, one can alternatively conjecture that the finding could be attributable to firms' having a higher post-UD demand for high-quality directors. Since director recruitment is a bilateral matching process, it is difficult to rule out the possibility that firm demand plays a role in the recruiting of high-quality outside directors. For example, in recruiting outside directors, firms could value demonstrated experience more than merely credentials. However, we have several reasons to believe that our observed improvement in director quality is unlikely to be driven by an increase in firms' demand for outside directors.

First, firms continually seek to recruit high-quality directors, so there is no compelling reason to expect this demand to significantly increase around UD adoptions. For example, *before* UD adoption, firms could be more concerned about shareholder litigation risk that arises from inefficient or failed R&D investment or M&A transactions, and therefore could raise demand for high-quality directors to help them improve their business decisions, so as to lower their litigation risk. Second, it is also not clear why firms with deteriorating corporate governance after UD adoption as found by Appel (2019) necessarily have a larger demand for high-quality directors. While arguably shareholders might want to see a change in board composition in response to deteriorating corporate governance and more entrenched officers and directors, in practice shareholders in the U.S. appear to have very limited power to successfully nominate new directors (Bebchuk, 2003; Cai et al., 2009) or replace existing directors (Bebchuk, 2007).

Third, more importantly even if firms have a higher demand for high-quality directors post-UD adoption, there will *not* be an increase in outside director quality if director candidates continue

to be concerned about litigation risk and remain unwilling to come onboard without a substantial increase in compensation. This reasoning implies that the above demand argument must also be predicated on the larger supply of high-quality candidates willing to accept nomination, presumably caused by UD adoption in order to explain our results. Taken together, our results are mainly attributable to a rise in director supply as UD adoption reduces director litigation risk, especially for high-quality director candidates leading them to be more willing to come onboard.

4.8 The performance effects of improvements in director quality

A natural question is whether the change in the quality of outside directors has any performance implications. The effects of UD adoption on the performance of treatment firms are two-fold: on one hand, more director protections may help improve director quality by facilitating hiring of better candidates (as we have shown); on the other hand, more director protections can also generate adverse incentive effects (Lin et al., 2013). Consistent with the latter view, Appel (2019) finds that UD adoption is associated with an increase in the adoption of governance provisions commonly opposed by shareholders (e.g., classified boards) and weaker operating performance (i.e., ROA) in firms with lax shareholder monitoring (proxied by less blockholder monitoring). UD adoption also appears to result in an increase in a firm's cost of equity (Houston et al., 2018) and cost of debt (Ni and Yin, 2018). Hence, in this section we conduct a supplementary test of whether after UD adoption, the observed improvement in outside director quality in treatment firms has any performance implications. Since closer blockholder monitoring should help limit the adverse director incentive effects engendered by UD adoption and may enable improved director quality to subsequently translate into an increase in firm performance, we predict that in firms with more blockholder monitoring, large improvements in director quality should lead to a more positive change in ROA around UD adoption.

To operationalize the supplementary test, we focus on treatment firms in the analysis (i.e., firms incorporated in a state that passed a UD between 1989 and 2005). Since it may take time for the effects of business decisions made by the board to show up in operational performance, we focus on the window of [-3, +5] around UD law adoption in analyzing a firm's pre-to-post change in average ROA (i.e., ΔROA). *Quality improvement* is an indicator variable that equals one if a firm's

pre-to-post change in the mean proportion of nominated high-quality outside directors is in the top tercile of the measure's sample distribution and zero otherwise. The definition of a nominated high quality outside director follows the definition in Table 8 and is explained in the legend to Table 12. *High blockholder* is an indicator variable that equals one if a firm's number of institutional blockholder (ownership > 5%) is above the sample median in the year before UD adoption and the firm does not experience a significant deterioration in blockholder monitoring over the post-event window; otherwise, *High blockholder* is set to 0. We interpret there to be a significant deterioration in blockholder monitoring after the UD law's passage if a firm's pre-to-post change in the number of blockholders (i.e., Post-event mean number of blockholders – the number of blockholders in the year before UD adoption) is below the 10th percentile level across the sample (which corresponds to a loss of more than one blockholder).[28]

We estimate OLS models to examine how the pre-to-post change in treatment firms' ROA around UD adoption changes when there is a large improvement in outside director quality, conditional on the firm having close blockholder monitoring. We control for event year fixed effects and cluster standard errors at the incorporation-state level. The results are reported in Table 12. We first verify that the mean of ΔROA is negative and statistically significant at the 1% level in an unreported test and this implies an average decline in operating performance around UD adoption. The pattern is broadly consistent with Appel's (2019) finding.

In Columns (1) and (2) of Table 12, we measure director quality by the experience metric. β_1 captures the effect of improved outside director quality on the ΔROA in firms that are subject to less blockholder monitoring. The β_1 coefficient in Column (1) is negative, but statistically insignificant in our sample, which is smaller than the sample Appel (2019) used. More importantly, the coefficient of its interaction with blockholder monitoring (β_2) is positive and statistically significant at the 5% level, suggesting that firms subject to more blockholder monitoring experience a more positive post-UD change in ROA. In addition, the combination of $(\beta_1 + \beta_2)$ reported in the lower section of Column (1) is positive and significant, consistent with firms that benefit from blockholder

[28] The results are robust if we impose a more stringent requirement – the pre-to-post change in the number of blockholders should be non-negative.

monitoring and improved director quality exhibiting a more positive post-UD change in ROA. In Column (2), we further control for the pre-to-post change in firms' average assets (logged) and leverage ratio and find that our inferences are qualitatively unaffected.

In Columns (3) and (4), we repeat the analysis measuring director quality by educational and professional background. We find that the coefficient of the interaction term is statistically insignificant (albeit positive as predicted). This result is consistent with the weaker results associated with the educational and professional background quality measure observed in the previous tables.

In summary, we find evidence that improved outside director quality following UD adoption is beneficial when blockholder monitoring helps constrain the self-serving actions of directors who are facing weakened incentives in post-UD adoption. Our finding that UD adoption makes it easier for firms to attract and retain high caliber outside directors could also help explain why on average there is only weak evidence that firm value drops post-UD adoption, even though director incentives are weakened (Appel, 2019).

5. Conclusion

The success of a company depends crucially on the quality of its outside directors. Companies frequently lament that outside director candidates are concerned about litigation risk and such concern inhibits firms from recruiting and retaining high caliber outside directors. Despite the important policy implications of this popular claim, there are almost no empirical evidence on this proposition. Moreover, empirical tests are hampered by the difficulty in measuring director litigation protections and director quality, and a limited amount of time series variation in protection measures. These factors make it difficult to establish causal relationships. We help fill this gap in the literature by exploiting the staggered adoption of state UDs as quasi-exogenous shocks to test whether the widely asserted director talent attraction and retention hypotheses can be validated empirically.

Using a difference-in-differences approach, we find that the quality of nominated outside directors improves with lower risk of shareholder derivative litigation resulting from a state's UD

adoption when director quality is measured by a director's experience metric. As expected, this effect is stronger for firms that face higher litigation risk or are surrounded by smaller local pools of director candidates before UD adoption. On average over our full sample, we find little evidence of significant improvement in outside director quality measured by their educational and professional backgrounds around UD adoption. However, we do find some evidence of improvements in this second director quality metric for firms operating in industries experiencing more shareholder derivative suits prior to UD adoption and by firms incorporated in Pennsylvania. We also show that the quality improvement in nominated outside directors after UD adoption is in part due to firms' improved ability to attract from non-UD states outside directors of better quality.

We also find some limited support for the talent retention hypothesis. Specifically, UD adoptions lower the voluntary departure rate of high-quality directors. However, the effect of UD adoptions on lowering the director turnover rate is similar for both high-quality and lower quality outside directors. The result is understandable given that in addition to litigation risk, other factors (e.g., relationship with the CEO, availability of outside career options, and possible board changes following a CEO turnover) also affect whether a director retains a board seat (Faleye, 2007). The differing results for the two broad dimensions of director quality suggest that more experienced directors are more time constrained and more concerned about the potentially larger reputational loss arising from litigation, which means there is a smaller supply of available director candidates. In contrast, candidates with other credentials (degrees, financial, legal and industry background) may be more readily available.

Overall, our study provides the first piece of evidence in support of the director talent attraction and retention hypotheses widely asserted by U.S. companies. Large improvement in outside director quality following UD adoption is associated with a more positive change in operating performance around UD adoption when large blockholder monitoring helps constrain the weakened director incentives post-UD adoption, attesting to the value of high-quality directors. These finding add to the on-going debate over the costs and benefits of lowering litigation risk faced by outside directors.

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Table 1 Staggered adoptions of a Universal Demand statute

This table reports the adoption year of a UD across 23 states in the U.S. from 1989 to 2005. The event list is the same as that is used in Houston et al. (2018).

Effective year	State abbreviation	States adopting a UD
1989	GA	Georgia
1989	MI	Michigan
1990	FL	Florida
1991	WI	Wisconsin
1992	MT	Montana
1992	UT	Utah
1992	VA	Virginia
1993	MS	Mississippi
1993	NH	New Hampshire
1995	NC	North Carolina
1996	AZ	Arizona
1996	NE	Nebraska
1997	CT	Connecticut
1997	ME	Maine
1997	PA	Pennsylvania
1997	TX	Texas
1997	WY	Wyoming
1998	ID	Idaho
2001	HI	Hawaii
2003	IA	Iowa
2004	MA	Massachusetts
2005	RI	Rhode Island
2005	SD	South Dakota

Table 2 Summary statistics

We use ten measures to capture an outside director candidate's quality. *Key_exec* is an indicator variable that equals one if an outside director candidate is a key executive in another company before nomination. *HP_firm* is an indicator variable that equals one if an outside director candidate comes from a public company with ROA above its industry (FF49) median in the year before nomination. *HI_patents* is an indicator variable that equals one if an outside director candidate comes from another company whose number of patents granted is above its (FF49) industry median in the year before nomination. *Multiple_seats* is an indicator variable that equals one if an outside director holds more than one company board seat in the year before nomination. Our results are similar under an alternative quality measure defined as whether an outside director candidate holds 1~3 board seats. *S&P 1500* is an indicator that equals one if an outside director candidate comes from a firm in the S&P 500 index, equals 2/3 if an outside director candidate comes from a firm in the S&P midcap index, equals 1/3 if an outside director candidate comes from a firm in the S&P small-cap index, in the year before nomination, and equals zero otherwise. *Degree* is a measure for an outside director candidate's highest academic degree. It equals one for a doctorate degree, 2/3 for a Master's degree, 1/3 for a Bachelor degree, and zero otherwise. *MBA* is an indicator variable that equals one if an outside director candidate has an MBA degree. *Financial* is an indicator variable that equals one if an outside director candidate has a financial background. *Legal* is an indicator variable that equals one if an outside director candidate has a legal background. *Industry* is an indicator variable that equals one if an outside director candidate is/was an executive or a director in another company within the same FF49 industry. *Experience* is the first principal component of the first five quality indicators (i.e., *Key_exec, HP_firm, HI_patents, Multiple_seats, S&P 1500*) to reflect an outside candidate's experience, and *Educ & Prof Backg* is the first principal component of the second five quality indicators (i.e., *Degree, MBA, Financial, Legal, Industry*) to reflect an outside candidate's credentials (educational and professional background). Panel A reports the summary statistics for the firm-year-level means of the ten director quality measures and two first principal components-based quality metrics of nominated outside directors, and some major firm characteristics. We winsorize continuous control variables at the 1st and 99th percentiles. Panel B reports a comparison of firm characteristics between treatment and control firms in the year prior to UD adoption, where standard errors are reported in the parentheses below the sample means for treatment and control firms, respectively. The last column of Panel B reports the *t*-statistic for the difference in means between the treatment and control firms. Please refer to Appendix A for detailed variable definitions.

Panel A: Summary statistics of variables at the firm-year level

Variables	N	Mean	SD	p25	p50	p75
Experience	4310	-0.144	1.077	-1.067	-0.431	0.455
Educ & Prof Backg	4310	0.036	0.890	-0.379	-0.265	0.108
Key_exec	4310	0.043	0.128	0	0	0
HP_firm	4310	0.248	0.297	0	0.167	0.500
HI_patents	4310	0.142	0.236	0	0	0.250
Multiple_seats	4310	0.340	0.331	0	0.333	0.500
S&P 1500	4310	0.113	0.192	0	0	0.167
Degree	4310	0.130	0.238	0	0	0.200
MBA (0/1)	4310	0.033	0.129	0	0	0
Financial (0/1)	4310	0.262	0.282	0	0.200	0.500
Legal (0/1)	4310	0.103	0.193	0	0	0.167
Industry (0/1)	4310	0.099	0.210	0	0	0.100
LnCashPay	4310	8.712	2.921	8.854	9.680	10.200
StkPay (0/1)	4310	0.759	0.427	1	1	1
LnMktVal	4268	5.712	1.933	4.316	5.623	7.075
Leverage	4308	0.227	0.201	0.039	0.204	0.356
Stk volatility	4063	1.062	0.575	0.647	1.036	1.460

Panel B: Comparison of firm characteristics in the year prior to UD adoption

Variables	Treatment firms	Control firms	*t*-statistic of the difference
LnMktVal	5.509	5.465	-0.11
	(0.214)	(0.348)	
Leverage	0.218	0.232	0.36
	(0.020)	(0.032)	
Stk volatility	1.047	1.093	0.24
	(0.096)	(0.170)	
LnCashPay	8.558	8.353	-0.35
	(0.310)	(0.497)	
StkPay	0.744	0.675	-0.53
	(0.067)	(0.112)	
Growth rate of Experience	-0.111	0.293	1.25
	(0.220)	(0.239)	
Growth rate of Educ & Prof Backg	-0.207	-0.343	-0.56
	(0.165)	(0.180)	

Table 3 Baseline results: Effects of UD adoptions on outside director quality

Panel A reports the results from a univariate DiD, where we compare the mean change from the Pre-event to Post-event period in the quality of nominated outside directors for treatment and control firms. For each treatment (control) firm, we first calculate the mean change in the average quality of nominated outside directors from the Pre-event period to the Post-event period, and then take the average to obtain the mean of the change in director quality from the Pre-event to Post-event period for the treatment (control) group. We then take the difference in the mean change in director quality from the Pre-event to the Post-event period for the treatment and control groups to obtain the difference-in-differences estimate and test its significance with Student *t*-tests. Panel B reports the results from difference-in-differences (DiD) regressions regarding the impact of UD adoptions on the quality of nominated outside directors. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* for nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* for nominated outside directors in a firm-year. $UD_{s,t}$ equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. Control variables are lagged by one year relative to the dependent variable unless stated otherwise. Detailed variable definitions are provided in Appendix A. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% levels (two-tailed) are indicated by *, ** and ***, respectively.

Panel A: Univariate DiD

	Mean of the change from the Pre-event to the Post-event period		Difference-in-Differences	
	Treatment firms (1)	Control firms (2)	Difference in change (1) – (2)	*t*-statistic for (1) – (2)
Experience	**0.114*****	0.035	**0.079***	1.76
Educ & Prof Backg	-0.032	0.005	-0.037	-1.06

Panel B: Regression DiD

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.151*****	**0.154*****	**0.033**	**0.039**
	(0.029)	**(0.028)**	**(0.095)**	**(0.097)**
Linked (%)		-0.005***		-0.001
		(0.002)		(0.002)
LnCashPay		-0.001		0.007
		(0.007)		(0.011)
StkPay (0/1)		-0.086		-0.017
		(0.067)		(0.054)
LnMktVal		0.058*		-0.054
		(0.031)		(0.034)
Leverage		-0.143		0.074
		(0.113)		(0.093)
Stk volatility		-0.060		-0.017
		(0.045)		(0.062)
Observations	4,309	4,060	4,309	4,060
Adjusted R^2	0.566	0.564	0.644	0.649
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table 4 Dynamic analysis of UD adoption effects on outside director quality

This table reports the results from dynamic DiD regressions examining the impact of UD adoptions on the quality of nominated outside directors. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats, and S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal, and Industry* of nominated outside directors in a firm-year. The dynamic DiD model setup closely follows Bertrand and Mullainathan (2003). *UD (-1*) equals one if a firm is incorporated in a state one year before the state adopted a UD, and it equals zero otherwise. *UD (0)* equals one if a firm is incorporated in a state in the year it adopted a UD, and it equals zero otherwise. *UD (+1*) equals one if a firm is incorporated in a state that adopted a UD one year ago, and it equals zero otherwise. *UD (+2*) and *UD (+3)* are defined analogously. Detailed variable definitions are provided in Appendix A. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% levels (two-tailed) are indicated by *, ** and ***, respectively.

	(1)	(2)
Y =	*Experience*	*Educ & Prof Backg*
UD (-1)	**0.044**	**0.021**
	(0.061)	**(0.050)**
UD (0)	0.156***	0.025
	(0.048)	(0.085)
UD (+1)	0.139***	0.035
	(0.051)	(0.104)
UD (+2)	0.126**	-0.009
	(0.061)	(0.090)
UD (+3)	0.317***	0.156
	(0.095)	(0.134)
Observations	4,309	4,309
Adjusted R^2	0.565	0.644
Firm FE	YES	YES
State-Year FE	YES	YES

Table 5 Evidence from the UD adoption in Pennsylvania

This table reports the baseline results from DiD regressions examining the impact of UD adoption on the quality of nominated outside directors in firms incorporated in Pennsylvania and their industry-size-year matched control firms. Pennsylvania's adoption of UD was implemented by the ruling of the Supreme Court of Pennsylvania in 1997 via *Cuker v. Mikalauskas* (1997). *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year.*UD_Penn* equals one if a firm is incorporated in Pennsylvania in 1997 or thereafter, and zero for otherwise. Detailed variable definitions are provided in Appendix A. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all the regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% levels (two-tailed) are indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD_Penn (0/1)	**0.233*** (0.056)**	**0.221*** (0.045)**	**0.106* (0.056)**	**0.103** (0.046)**
Observations	988	940	988	940
Adjusted R^2	0.547	0.538	0.596	0.575
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table 6: Robustness check with multiple hypothesis testing

This table reports the results of the robustness check by conducting a multiple hypothesis test that considers our main dependent variables (*Experience* and *Educ & Prof Backg*) jointly with nine other outcome variables from the existing literature using the UD law setting. Namely, cost of equity (*Re*) (Houtson et al., 2018), the frequency of management earnings forecasts (*Ln(freqmsf)*) (Bourveau et al., 2018), (weighted average of) spread of syndicate loans (*COD*) in a firm-year (Ni and Yin, 2018), (weighted average of) acquirer's three-day CAR centered at the deal announcement day (*CAR (-1, 1)*) in a firm-year (Chu and Zhao, 2020), R&D expenditures (*R&D*) (Lin et al., 2020), cash to assets ratio (*Cash*) (Nguyen et al., 2018), market leverage (*Mlev*) (Nguyen et al., 2020), idiosyncratic volatility (*Idivol*) (Le et al., 2020), and *E-Index* (Appel, 2019). Following the free step-down resampling procedure in Westfall and Young (1993), we employ a firm-level clustered bootstrap with 1,000 repetitions, repeat the DiD analysis for each dependent variable in each bootstrap sample, and calculate the adjusted *p*-values. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. $UD_{s,t}$ is an indicator variable that equals one if the firm's incorporation-state *s* has passed a UD by year *t*, and equals zero otherwise. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all the regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level.

Dependent variables	Coefficient on *UD*	Std. error	*p*-value	Adjusted *p*-value
Experience	0.151	0.029	0.000	0.002
Educ & Prof Backg	0.033	0.095	0.728	0.958

Table 7: Effects of UD on the quality of outside directors: Evidence from using matched pair firms with a close headquarters-state distance

This table reports the results from DiD regressions examining the impact of UD adoptions on the quality of nominated outside directors using a subsample of treatment firms and matched control firms whose headquarters-state distance is within 60 (or 100) miles. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. $UD_{s,t}$ is an indicator variable that equals one if the firm's incorporation-state *s* has passed a UD by year *t*, and equals zero otherwise. Detailed variable definitions are provided in Appendix A. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all the regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% levels (two-tailed) are indicated by *, ** and ***, respectively.

Panel A: Using firm pairs with headquarters-state distances 60 miles (100 kilometers) or less

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.360****	**0.431*****	**-0.028**	**0.025**
	(0.090)	**(0.047)**	**(0.036)**	**(0.043)**
Observations	117	116	117	116
Adjusted R^2	0.384	0.354	0.639	0.620
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Panel B: Comparison of headquarters-state (HQ) characteristics for the paired firms in Panel A

Variables	Treatment firms' HQ	Control firms' HQ	*T*-statistic of the difference
Ln(State GDP)	12.828	12.828	0.00
	(0.287)	(0.287)	
Ln(State population)	16.111	16.111	0.00
	(0.338)	(0.338)	
State unemployment rate (%)	5.38	5.38	0.00
	(0.003)	(0.003)	
Poverty rate (%)	12.46	12.46	0.00
	(0.017)	(0.017)	

Panel C: Using firm pairs with headquarters-state distances of 100 miles or less

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.383*****	**0.490*****	**-0.044**	**0.014**
	(0.094)	**(0.081)**	**(0.039)**	**(0.032)**
Observations	144	143	144	143
Adjusted R^2	0.399	0.367	0.629	0.615
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Panel D: Comparison of headquarters-state (HQ) characteristics for the paired firms in Panel C

Variables	Treatment firms' HQ	Control firms' HQ	*T*-statistic of the difference
Ln(State GDP)	12.828	12.797	-0.09
	(0.287)	(0.236)	
Ln(State population)	16.111	16.080	-0.07
	(0.338)	(0.278)	
State unemployment rate (%)	5.38	5.367	-0.04
	(0.003)	(0.002)	
Poverty rate (%)	12.46	11.933	-0.23
	(0.017)	(0.015)	

Table 8 The change in the proportion of high-quality outside directors hired from firms incorporated in states without a UD

This table reports the results from difference-in-differences (DiD) regressions examining the proportion of high-quality nominated outside directors hired from states without a UD. The dependent variable is the proportion of nominated outside directors whose *Experience* quality metric or *Educ & Prof Backg* quality metric is in the top tercile of the sample distribution in a year and whose firms are incorporated in states without a UD, among the number of nominated outsider directors in a firm-year. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. Detailed variable definitions are provided in Appendix A. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) is indicated by *, ** and ***, respectively.

Y= *Proportion of high-quality outside directors from states without a UD*	(1)	(2)	(3)	(4)
	Experience		*Educ & Prof Backg*	
UD (0/1)	**0.024****	**0.024****	**0.025****	**0.029*****
	(0.011)	**(0.010)**	**(0.011)**	**(0.010)**
Observations	4,309	4,060	4,309	4,060
Adjusted R^2	0.468	0.462	0.391	0.397
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table 9 Heterogeneity in the effects of UD adoptions on the quality of outside directors

This table reports the results from cohort-based DiD regressions examining how the impact of UD adoptions on the quality of nominated outside directors varies with two measures of a firm's pre-event litigation risk (the frequency of engaging in M&As, or the corresponding industry risk of derivative suits) (Columns (1) and (2)), the existing firm-level LLP protections (Column (3)), or the size of the local pool of director candidates (Column (4)). A cohort includes all firms incorporated in states that adopted a UD in the same year (treatment firms) and their industry-size-year matched control firms incorporated in states without a UD. For all firms in a cohort, observations over the window [-3, +3] are included, subject to data availability. *Low M&A* is an indicator for low M&A activity, and it equals one if the total number of a firm's completed M&A deals in the year before UD adoption is in the bottom tercile of the sample distribution. *Low M&A* is associated with low litigation risk. *Low derivative suit risk* is an indicator variable that equals one if the total number of derivative suits in the Fama-French 49 industry to which a firm belongs in the year before UD adoption is in the bottom tercile of the sample distribution. *LLP protection index* is the sum of three director liability limiting provisions (LLPs) including the director liability limitation provision (*Dir liab*), the indemnification provision (*Dir ind*), and indemnification contracts (*Dir indc*) in a firm's corporate charter/bylaws in the year before UD adoption. *Large local pool* is an indicator variable that equals one if a firm's local pool of director candidates is in the top tercile of the sample distribution in the year before the UD adoption. Detailed variable definitions are provided in Appendix A. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* where a firm is incorporated has passed a UD statute by year *t*, and zero for otherwise. *Post* is an indicator that equals one for the year from the adoption year onward. Control firms follow the *Post* definition of their matched treatment firms. We include firm-cohort fixed effects (Firm-Cohort FE) and headquarters state-year-cohort fixed effects (State-Year-Cohort FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Panel A reports the heterogeneous effect on nominated outsider directors' *Experience* quality metric, and Panel B reports the heterogeneous effect on nominated outsider directors' *Educ & Prof Backg* quality metric. We use the same control variables as in Table 3. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) is indicated by *, ** and ***, respectively.

Panel A: Heterogeneous effect on outside director quality (Experience)

	(1)	(2)	(3)	(4)
	Pre-event characteristic =			
Y= *Experience*	*Low M&A*	*Low derivative suit risk*	*LLP protection index*	*Large local director pool*
UD (0/1) (β_1)	0.319***	0.578***	0.311**	0.320***
	(0.075)	(0.106)	(0.117)	(0.054)
UD×Pre-event characteristic (β_2)	**-0.173****	**-0.205***	**-0.035**	**-0.315****
	(0.083)	**(0.113)**	**(0.093)**	**(0.151)**
Post×Pre-event characteristic	0.135**	0.081	0.027	0.159
	(0.062)	(0.098)	(0.064)	(0.180)
Observations	4,100	1,162	2,228	2,005
Adjusted R^2	0.555	0.450	0.482	0.419
$\beta_1 + \beta_2$	0.146***	0.373***	0.280***	0.005
$\beta_1 + \beta_2 (or\ \beta_2 \times$ Mean LLP)=0 *p*-value	0.002	0.000	0.001	0.966
Firm controls in Table 3	YES	YES	YES	YES
Firm-Cohort FE	YES	YES	YES	YES
State-Year-Cohort FE	YES	YES	YES	YES

Panel B: Heterogeneous effect on outside director quality (Educ & Prof Backg)

	(1)	(2)	(3)	(4)
	Pre-event characteristic =			
Y= *Educ & Prof Backg*	*Low M&A*	*Low derivative suit risk*	*LLP protection index*	*Large local director pool*
UD (0/1) (β_1)	-0.032	0.212**	-0.080	0.064**
	(0.089)	(0.098)	(0.079)	(0.031)
UD×Pre-event characteristic (β_2)	**0.099**	**-0.155**	**-0.004**	**0.030**
	(0.104)	**(0.113)**	**(0.051)**	**(0.072)**
Post×Pre-event characteristic	-0.063	-0.025	-0.021	-0.002
	(0.094)	(0.091)	(0.043)	(0.041)
Observations	4,100	1,162	2,228	2,005
Adjusted R^2	0.624	0.638	0.594	0.591
$\beta_1 + \beta_2$	0.067	0.057	-0.084	0.094
$\beta_1 + \beta_2 (or\ \beta_2 \times$ Mean LLP)=0 *p*-value	0.584	0.302	0.126	0.322
Firm controls in Table 3	YES	YES	YES	YES
Firm-Cohort FE	YES	YES	YES	YES
State-Year-Cohort FE	YES	YES	YES	YES

Table 10 Effects of UD adoptions on the retention of incumbent outside directors

This table reports the results from cohort-based director-year-level DiD regressions regarding the impact of UD adoptions on the retention of incumbent outside directors. We test whether the chance of a high-quality outside director's voluntary departure changes around the adoption of a UD, as captured by the coefficient estimate of *UD* (β_1). *Voluntary departure* is an indicator variable that equals one if an outside director voluntarily leaves the board in year *t*+1. *Experience* is the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of a nominated outside director, and *Educ & Prof Backg* is the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of a nominated outside director. *Low quality* is an indicator variable that equals one if the value of an outside director's corresponding quality measure is below the top tercile of the sample distribution in a year. $UD_{s,t}$ is an indicator variable (i.e., *Treat*×*Post*) that equals one if the state (*s*) in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. *Treat* is an indicator variable that equals one if a firm is incorporated in a state that adopted a UD in the sample period, and zero otherwise. *Post* is an indicator variable that equals one for treatment firms from the adoption year onward; control firms follow the *Post* definition of their matched treatment firms. Detailed variable definitions are provided in Appendix A. Firms in a cohort includes all firms incorporated in states that adopted a UD in the same year (treatment firms) and their matched control firms incorporated in states without a UD. For all firms in a given cohort, observations over the window [-3, +3] are included (with the adoption year being year 0), subject to data availability. We include firm-cohort fixed effects (Firm-Cohort FE) and headquarters state-year-cohort fixed effects (State-Year-Cohort FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) is indicated by *, ** and ***, respectively. Only outside directors from non-classified boards are included in the analysis.

	(1)	(2)	(3)	(4)
Y= *Voluntary departure (0/1)*	*Experience*		*Educ & Prof Backg*	
UD (0/1) ($\boldsymbol{\beta_1}$)	**-0.057***	**-0.069****	**-0.077***	**-0.077****
	(0.032)	**(0.033)**	**(0.040)**	**(0.037)**
UD×Low quality (β_2)	-0.013	0.001	0.015	0.013
	(0.016)	(0.018)	(0.030)	(0.027)
Treat×Low quality	0.007	-0.004	0.016	0.008
	(0.017)	(0.018)	(0.020)	(0.017)
Post×Low quality	0.013	0.003	0.012	0.018
	(0.014)	(0.013)	(0.021)	(0.013)
Low quality (0/1)	0.000	0.008	-0.008	-0.012
	(0.014)	(0.012)	(0.017)	(0.013)
Age>65 (0/1)		0.029***		0.029***
		(0.006)		(0.006)
Female (0/1)		-0.014		-0.014
		(0.018)		(0.018)
Linked (0/1)		0.012		0.013
		(0.008)		(0.008)
Attendance<75% (0/1)		0.036		0.035
		(0.024)		(0.024)
DirOwn		-0.045		-0.046
		(0.086)		(0.089)
Observations	9,211	8,452	9,211	8,452
Adjusted R^2	0.063	0.062	0.064	0.062
$\beta_1 + \beta_2$	-0.071**	-0.068**	-0.062**	-0.065**
$\beta_1 + \beta_2$=0 *p*-value	0.033	0.038	0.050	0.047
Firm controls in Table 3	NO	YES	NO	YES
Firm-Cohort FE	YES	YES	YES	YES
State-Year-Cohort FE	YES	YES	YES	YES

Table 11 Can the improvement in outside director quality be due to an improvement in director compensation policy?

This table reports the difference-in-differences (DiD) regressions regarding the impact of UD adoptions on a firm's compensation policy for outside directors as measured by two variables, *LnCashPay* and *StkPay (0/1)*. *LnCashPay* is the natural logarithm of (annual cash retainer fee + total board meeting fee + 1). *StkPay* is an indicator variable that equals one if a firm grants stocks or stock options to outside directors. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. Control variables are lagged by one year relative to the dependent variable. Detailed variable definitions are provided in Appendix A. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) is indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
Y=	*LnCashPay*		*StkPay (0/1)*	
UD (0/1)	**0.151**	**-0.085**	**0.002**	**0.014**
	(0.138)	**(0.170)**	**(0.022)**	**(0.024)**
Linked (%)		-0.008		-0.001
		(0.006)		(0.001)
LnMktVal		0.050		-0.001
		(0.129)		(0.015)
Leverage		0.279		-0.065**
		(0.602)		(0.029)
Stk volatility		-0.080		-0.014
		(0.116)		(0.022)
Observations	4,380	4,127	4,380	4,127
Adjusted R^2	0.781	0.795	0.776	0.780
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table 12 Value effects of improvement in director quality

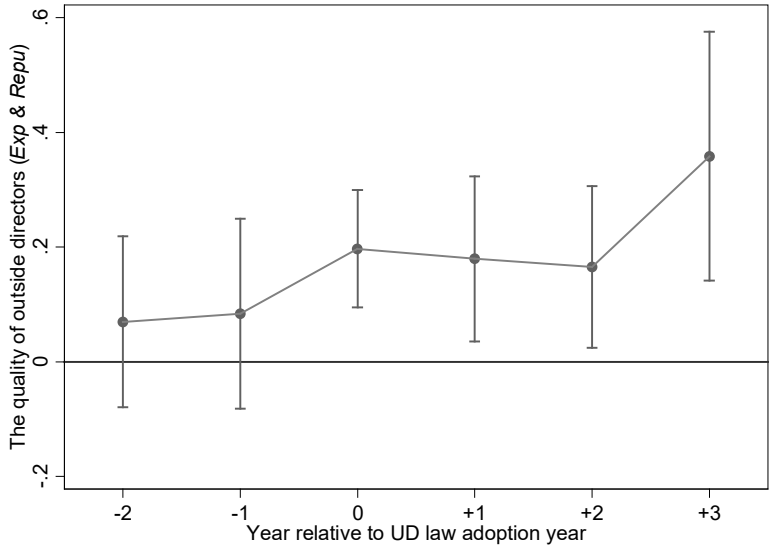
This table reports the effects of treatment firms' change in director quality on the change in average ROA conditional on the intensity of firms' shareholder monitoring over the window of [-3, +5] around UD law adoption. Only treatment firms (i.e., those that are incorporated in states that passed a UD law between 1989 and 2005) are included in the analysis. ΔROA is a firm's pre-to-post change in average ROA over the window [-3, +5]. We examine five years post UD-adoption to allow more time for the effects of director decisions to show up in operating performance. *Quality improvement* is a dummy variable that equals one if a firm's pre-to-post change in the average proportion of nominated high-quality outside directors is in the top tercile of the measure's sample distribution and zero otherwise. A nominated outside director is deemed to be of high quality if his/her *Experience* quality metric or *Educ & Prof Backg* quality metric is in the top tercile of the sample distribution in a year. *High blockholder* is a dummy variable that equals one if a firm's number of institutional blockholder (ownership >5%) is above the sample median in the year before UD law passage and does not experience a significant deterioration in blockholder monitoring after UD law passage; otherwise, *High blockholder* is set to 0. We consider that there is a significant deterioration in blockholder monitoring after UD law passage if the pre-to-post change in the number of blockholders (i.e., Post-event mean number of blockholders – the number of blockholders in the year before UD adoption) is below the 10th percentile of the variable (which corresponds to a value of -1). Control variables are measured in the pre-to-post change in the average of the corresponding variables. Event year FE are dummy variables denoting each UD law passage year. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) is indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
	Director quality =			
Y = ΔROA*[-3, +5]*	*Experience*		*Educ & Prof Backg*	
Quality improvement (β_1)	-0.013	-0.014	0.009	0.001
	(0.020)	(0.016)	(0.036)	(0.035)
High blockholder*×*Quality improvement ($\boldsymbol{\beta_2}$)	**0.053****	**0.051****	**0.004**	**0.013**
	(0.020)	**(0.019)**	**(0.039)**	**(0.039)**
High blockholder	-0.002	0.001	0.016	0.014
	(0.007)	(0.006)	(0.014)	(0.015)
$\Delta LnAT$		0.012		0.011
		(0.014)		(0.014)
$\Delta Leverage$		-0.273***		-0.275***
		(0.095)		(0.090)
Observations	365	365	365	365
Adjusted R^2	-0.004	0.041	-0.010	0.036
$\beta_1 + \beta_2$	0.040***	0.037***	0.013	0.014
$\beta_1 + \beta_2$ *p*-value	0.000	0.000	0.290	0.302
Event year FE	YES	YES	YES	YES

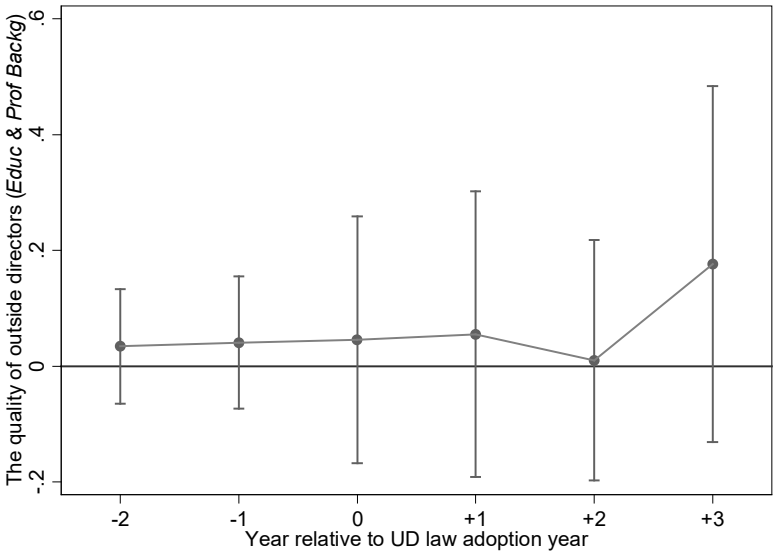
Figure 1: Dynamic treatment effects of UD adoption on the quality of outside directors

This Figure shows the dynamic treatment effects of UD adoption on the quality of nominated outside directors, and the 95% confidence intervals for such effects. Panel A reports the results on the quality of outside directors measured by the experience metric (*Experience*), which is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year. Panel B reports the results on the quality of outside directors measured by the educational and professional background of nominated outside directors (*Educ & Prof Backg*), which is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year.

Panel A: Dynamic treatment effects on Experience



Panel B: Dynamic treatment effects on Educ & Prof Backg



Appendix A: Variables definitions

Variable	Definition
Director quality measures	
The quality metric on an outside director candidate's experience	
Experience	The composite metric for a candidate's experience, which is the first principal component of the five director quality measures capturing a candidate's experience (i.e., *Key_exec, HP_firm, HI_patents, Multiple_seats, S&P 1500*).
Alt Experience	The alternative composite metric for a candidate's experience, which is the simple aggregation of the five director quality measures capturing a candidate's experience (i.e., *Key_exec, HP_firm, HI_patents, Multiple_seats, S&P 1500*).
Key_exec (0/1)	An indicator variable that equals one if an outside director candidate is a key executive with one, or some, of the titles: chief executive officer (CEO), president, chairman, chief financial officer (CFO), chief information officer (CIO), chief operating officer (COO), vice president (VP), executive VP, senior VP, partner, managing director, or treasurer (Knyazeva et al., 2013) in another company before nomination.
HP_firm (0/1)	An indicator variable that equals one if an outside director candidate comes from a public company with ROA above its Fama-French 49 industry median in the year before nomination.
HI_patents (0/1)	An indicator variable that equals one if an outside director candidate comes from a company whose number of patents granted is above its Fama-French 49 industry median in the year before nomination.
Multiple_seats (0/1)	An indicator variable that equals one if an outside director candidate holds more than one company board seat before being nominated; it equals zero otherwise.
S&P 1500	An indicator that equals one if an outside director candidate comes from a firm in the S&P 500 index, equals 2/3 if an outside director comes from a firm in the S&P midcap index, equals 1/3 if an outside director comes from a firm in the S&P small-cap index, in the year before nomination, and equals zero otherwise.
The quality metrics on educational and professional background of an outside director candidate	
Educ & Prof Backg	The composite metric for an outside director candidate's educational and professional background, which is the first principal component of the five director quality measures capturing a candidate's educational and professional background (i.e., *Degree, MBA, Financial, Legal, Industry*).
Alt Educ & Prof Backg	The alternative composite metric for an outside director candidate's educational and professional background, which is the simple aggregation of the five director quality measures capturing a candidate's educational and professional background (i.e., *Degree, MBA, Financial, Legal, Industry*).
Degree	A measure for an outside director candidate's highest academic degree. It equals one for a doctorate degree, 2/3 for a Master's degree, 1/3 for a Bachelor degree, and zero otherwise.
MBA (0/1)	An indicator variable that equals one if an outside director candidate has a Master of Business Administration (MBA) degree, and zero otherwise.
Financial (0/1)	An indicator variable that equals one if an outside director candidate has a financial background (is/was a CFO, a treasurer, a banker, an accountant, an auditor, or a securities broker; or worked/is working in a venture capital, a private equity, an investment bank; or majored in finance or accounting).
Legal (0/1)	An indicator variable that equals one if an outside director candidate has a legal background (is/was an attorney, a legal counsel, a lawyer; or majored in law).

Industry (0/1)	An indicator variable that equals one if an outside candidate is/was an executive or a director of a listed company in the same FF49 industry as the focal company.

Key explanatory variables

UD (0/1)	$UD_{s,t}$ equals one if state *s* in which a firm is incorporated has passed a Universal Demand law (UD) by year *t*, and zero for otherwise. *UD* in our matched sample fixed window analysis can be conceptualized as *Treat*×*Post*, where *Treat* is an indicator variable that equals one if the firm's state of incorporation passed a UD statute; it equals zero otherwise. *Post* is an indicator variable that equals one for the UD adoption year and thereafter for treatment firms; control firms' pseudo *Post* follows the *Post* definition of their matched treatment firms.
UD (-1), UD (0), UD (+1), UD (+2), UD (+3)	Indicator variables: *UD (-1*) equals one if a firm is incorporated in a state one year before the state adopted a UD, and zero otherwise. *UD (0)* equals one if a firm is incorporated in a state in the year the state adopted a UD, and zero otherwise. *UD (+1*) equals one if a firm is incorporated in a state that adopted a UD one year ago, and zero otherwise. *UD (+2*) and *UD (+3)* are defined analogously.
AT statutes	A simple aggregation of the five anti-takeover statute adoption indicator variables, namely *DD, CSA, BC, FP* and *PP*. Those law indicator variables equal one if the state in which a firm is incorporated has passed a director duty law (DD), a control share acquisition law (CSA), a business combination law (BC), a fair price law (FP), or a poison pill law (PP) by a year, and zero otherwise.
Low M&A (0/1)	An indicator variable for low M&A activity, and it equals one if the total number of a firm's completed M&A deals in the year before UD adoption is in the bottom tercile of the sample distribution, and zero otherwise.
Low derivative suit risk (0/1)	An indicator variable that equals one if the total number of derivative suits in the Fama-French 49 industry to which a firm belongs in the year before UD adoption is in the bottom tercile of the sample distribution, and zero otherwise. Derivative lawsuits are sourced from the Audit Analytics database that provides derivative lawsuit details since 1996.
Large local pool (0/1)	An indicator variable that equals one if a firm's local pool of director supply is in the top tercile of the sample distribution in the year before the adoption of a UD, and zero otherwise. Following Knyazeva et al. (2013), a firm's local pool of director supply is defined as the number of non-financial S&P 1500 firms whose business addresses are within 60 miles of a firm's headquarters, excluding firms in the same 4-digit SIC industry (as they are likely competitors of the firm concerned). The latitude and longitude information of a firm's business address is obtained from the data compiled by Prof. Bill McDonald.
LLP protection index	The sum of the existence of the following three provisions limiting director liability in corporate charters/bylaws: the director liability limitation provision (*Dir liab*), the director indemnification provision (*Dir ind*), and indemnification contracts (*Dir indc*) in the year before UD adoption (Bradley and Chen, 2011).

Firm characteristics

Leverage	Book leverage, defined as book value of long-term debt (DLTT) plus short-term debt (DLC) scaled by book value of total assets (AT).
Stk volatility	Natural logarithm of the standard deviation of a firm's percentage daily stock return in a year.
LnMktVal	Natural logarithm of the market value of firm (AT-CEQ+PRCC_F×CSHO)
ROA	Return on assets, defined as income before extraordinary items (IB) scaled by average total assets (AT) in a year.

Board characteristics

LnCashPay	Expected cash pay to an outside director, defined as the natural logarithm of (annual cash retainer fee + the number of regular board meetings a year × attendance fee per meeting for an outside director +1). The pay is measured in dollars before the log transformation.
StkPay (0/1)	An indicator variable that equals one if a firm has a policy of granting stocks or stock options to outside directors, and zero otherwise.
Linked (%)	The percentage of linked directors in a board.

Director characteristics

Age>65 (0/1)	An indicator variable that equals one if the age of an outside director is over 65.
Female (0/1)	An indicator variable that equals one if an outside director is female.
Linked (0/1)	An indicator variable that equals one if an outside director is a linked/grey/affiliated director.
Attendance<75%(0/1)	An indicator variable that equals one if an outside director attended less than 75% of board meetings in a year.
Voluntary departure (0/1)	An indicator variable that equals one if an outside director voluntarily leaves the board in next period for reasons other than "reach the maximum of contract term period", "died", "sick", "departure due to the violation of law" and "accept a position in the government".
DirOwn	Number of shares held by an incumbent outside director, scaled by a firm's total number of shares outstanding (and this measure is used in the talent retention test).

State characteristics

Ln(State GDP)	Natural logarithm of total GDP (in million dollars) in a state, obtained from the Bureau of Economic Analysis.
Ln(State population)	Natural logarithm of population (in persons) in a state, obtained from the Bureau of Economic Analysis.
State unemployment rate (%)	The unemployment rate in a state, obtained from the U.S. Bureau of Labor Statistics, Local Area Unemployment Statistics and Current Population Survey.
Poverty rate (%)	The poverty rate in a state, obtained from the U.S. Bureau of the Census, Current Population Survey, Annual Social and Economic Supplements.
Ln(# of incorporated firms)	Natural logarithm of the number of firms incorporated in a state.

Appendix B Validating the UD adoption as a quasi-exogenous setting

We verify that a state's decision to adopt a UD is not associated with the quality of outside directors in firms incorporated in that state. The purpose of this test is to examine whether firms facing difficulties in recruiting high-quality directors lobby their states of incorporation to pass a UD earlier or more quickly. If the answer is yes, then it suggests that UD adoptions are partially endogenous with respect to outside director quality in firms incorporated in those states. The following test represents our initial effort to assess this issue.

We use a Weibull hazard model where the dependent variable is the log of the expected time until UD adoption. The time until UD adoption is defined as the year in which a UD is adopted in the state minus 1986 (the first year of our sample period). If a state has not passed a UD by the end of our sample period, the expected time of passage is set to the value of (2008 minus 1996), where 2008 is the last year of our sample period. Observations are dropped from the analysis once a state has adopted a UD since we are interested in examining the timing of UD adoption.

In each state-year, we calculate the means for our two outside director quality metrics using all the sample firms incorporated in the state to obtain state-wide director quality measures. Apart from the two state-level director quality metrics, we include a number of time-varying state characteristics (GDP, population, unemployment rate, poverty rate, the log number of firms incorporated in the state, and passage of second-generation antitakeover laws) to capture key state macroeconomic conditions and the potential effects on litigation risk that firms face.

The following table shows the Weibull hazard model estimates of the expected time until UD adoption. Importantly, we find insignificant coefficients on the state's two lagged average outside director quality metrics for firms incorporated in the state. This is consistent with the average quality of outside directors at firms incorporated in the state not significantly affecting the speed of a state's UD adoption. This suggests that a state's UD adoption is unrelated to the prior quality of the outside directors of firms incorporated in that state. Moreover, we find that states with a lower GDP and a larger population tend to adopt UDs more quickly.

Table B1 Validating the UD adoption setting

This table reports the results from a Weibull duration regression model under an accelerated failure-time (AFT) formulation. The sample period is from 1986-2008. The dependent variable is the logged expected time to a state's UD adoption year. If a state had no UD by the end of our sample period, the expected time of passage is set to be the value of 2008 minus 1986. State-years are dropped from the analysis once they have adopted a UD. *Experience_mean* is the simple average of the *Experience* quality metric of nominated outside directors for all sample firms incorporated in a state in a year. *Educ & Prof Backg_mean* is the simple average of the *Educ & Prof Backg* quality metric of nominated outside directors for all sample firms incorporated in a state in a year. The model controls for a state's macroeconomic condition and adoption of antitakeover laws including business combination laws (*BC*), control share acquisition laws (*CSA*), fair price laws (*FP*), director duty laws (*DD*), and poison pill laws (*PP*). *AT statutes* is a simple aggregation index of the five law indicator variables, namely *BC, DD, CSA, FP*, and *PP. BC* is an indicator variable that equals one if the state in which a firm is incorporated has passed a BC law, and zero for other firm-years within our sample. *DD, CSA, FP*, and *PP* are defined analogously. All explanatory variables are measured at the state level and lagged by one year. See Appendix A for detailed variable definitions. Robust standard errors are clustered at the incorporation state level, with standard errors reported in parentheses, *, **, and *** denote statistical significance level at the 10%, 5%, and 1% level (two-tailed), respectively.

Duration model	Weibull (AFT formulation)		
Y = *Ln(Expected time)*	(1)	(2)	(3)
Ln(State GDP)	1.586***	1.234	1.195
	(0.475)	(0.900)	(0.912)
Ln(State population)	-1.551**	-1.090	-1.049
	(0.525)	(1.006)	(1.010)
State unemployment rate (%)	-0.032	-0.022	-0.016
	(0.058)	(0.136)	(0.136)
Poverty rate (%)	0.039	0.040	0.038
	(0.033)	(0.060)	(0.061)
Ln(# of incorporated firms)	-0.012	0.405	0.413
	(0.087)	(0.336)	(0.336)
AT statutes	-0.067	-0.135	-0.127
	(0.051)	(0.121)	(0.111)
Experience_mean		**0.039**	
		(0.141)	
Educ & Prof Backg_mean			**-0.060**
			(0.192)
Observations	822	370	370

Internet Appendix for

Director Liability Protections and the Quality of Outside Directors

Table IA1: Are the results due to confounding law enactments and the 2008 financial crisis?

This table reports the DiD results after controlling for the effects of confounding laws including directors' duties (DD), business combination (BC), control share acquisition (CSA), fair price (FP), and poison pill (PP) laws. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. *AT statutes* is a simple aggregation index of the five law indicator variables, namely *DD, CSA, BC, FP* and *PP*. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. *BC* is an indicator variable that equals one if the state in which a firm is incorporated has passed a BC law, and zero for other firm-years within our sample. *DD, CSA, FP*, and *PP* are defined analogously. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) are indicated by *, ** and ***, respectively.

Panel A: Are the results due to confounding law enactments?

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.157*** **	**0.153*** **	**0.015**	**0.018**
	(0.034)	**(0.033)**	**(0.114)**	**(0.110)**
AT statutes	-0.023	0.005	0.066	0.078
	(0.057)	(0.046)	(0.066)	(0.049)
Observations	4,309	4,060	4,309	4,060
Adjusted R^2	0.565	0.564	0.644	0.649
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Panel B: Excluding the 2008 financial crisis period (observations in 2008)

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.151*** **	**0.154*** **	**0.033**	**0.039**
	(0.029)	**(0.028)**	**(0.095)**	**(0.097)**
Observations	4,297	4,048	4,297	4,048
Adjusted R^2	0.566	0.564	0.644	0.649
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table IA2: Are the results due to SOX and related exchange listing requirements?

This table reports the results from tests regarding the confounding effect of SOX. Panel A reports the results after controlling for the lagged percentage of independent directors, because corporate boards that are less independent are more affected by the exchange listing requirements on board independence following the passage of SOX. Panel B reports the results from DiD regressions regarding the impact of UD adoption on the quality of nominated outside directors only using events up to 1998 and these events are not affected by SOX. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. $UD_{s,t}$ equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) are indicated by *, ** and ***, respectively.

Panel A: Controlling for the lagged percentage of independent directors

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.115****	**0.136*****	**0.064**	**0.090**
	(0.046)	**(0.043)**	**(0.090)**	**(0.102)**
Observations	3,617	3,471	3,617	3,471
Adjusted R^2	0.562	0.559	0.652	0.657
Lagged % of independent directors	YES	YES	YES	YES
Control variables in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Panel B: Using UD adoption events up to 1998 only

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.120*****	**0.129*****	**0.030**	**0.042**
	(0.035)	**(0.038)**	**(0.107)**	**(0.109)**
Observations	3,403	3,201	3,403	3,201
Adjusted R^2	0.599	0.598	0.635	0.640
Control variables in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table IA3 Effects of UD on the quality of outside directors: Director-year-level results

This table reports the results from DiD regressions examining the impact of UD adoptions on the quality of nominated outside directors. The analysis is conducted at the director-year level. *Experience* is the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats, S&P 1500* of a nominated outside director, and *Educ & Prof Backg* is the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal, Industry* of a nominated outside director. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) are indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1)	**0.168*** **	**0.190*** **	**0.058**	**0.074**
	(0.031)	**(0.028)**	**(0.073)**	**(0.078)**
Age>65 (0/1)		-0.062		-0.134***
		(0.064)		(0.032)
Female (0/1)		-0.155*		-0.003
		(0.091)		(0.062)
Linked (0/1)		-0.393***		-0.197***
		(0.063)		(0.036)
Observations	16,568	15,801	16,568	15,801
Adjusted R^2	0.295	0.302	0.352	0.360
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table IA4 Robustness check: Effects of UD adoptions on the quality of independent directors

This table reports the results from difference-in-differences (DiD) regressions examining the impact of UD adoptions on the quality of nominated independent directors. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated independent directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated independent directors in a firm-year. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Robust standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) are indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD	**0.097****	**0.109****	**0.030**	**0.032**
	(0.042)	**(0.049)**	**(0.130)**	**(0.143)**
Observations	4,006	3,788	4,006	3,788
Adjusted R^2	0.559	0.555	0.659	0.665
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table IA5: Are the results robust to a simple aggregation of director quality items?

This table reports the results from difference-in-differences (DiD) regressions regarding the impact of UD adoptions on the quality of nominated outside directors. *Experience_alter* is the mean of the simple aggregate quality index of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg_alter* is the mean of the simple aggregate quality index of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. We include firm fixed effects (Firm FE) and headquarters state-by-year fixed effects (State-Year FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) are indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
Y=	*Alt Experience_*		*Alt Educ & Prof Backg_*	
UD (0/1)	**0.102*** (0.028)**	**0.104*** (0.028)**	**0.028* (0.014)**	**0.029* (0.016)**
Observations	4,309	4,060	4,309	4,060
Adjusted R^2	0.583	0.582	0.581	0.584
Firm controls in Table 3	NO	YES	NO	YES
Firm FE	YES	YES	YES	YES
State-Year FE	YES	YES	YES	YES

Table IA6: Differential effects: High-technology vs Non-high-technology industry

This table tests whether high-technology companies disproportionately benefit more from the litigation protections of a UD in terms of the recruiting of high caliber outside directors. Following Barron et al. (2002), we define high-technology manufacturing companies as firms whose three-digit SIC codes equals 283 (Drugs), 284 (Chemicals), 357 (Computer and Office Equipment), 366 (Communications Equipment), 367 (Electronics), 371 (Motor Vehicles), 382 (Measurement and Control Devices), 384 (Medical Instruments), or 737 (Software). *Non-Hi tech* is an indicator variable that equals one if a firm's three-digit SIC code does not belong to any of the above high-technology categories in the year before a UD adoption. *Experience* is the mean of the first principal component of the following five quality measures: *Key_exec, HP_firm, HI_patents, Multiple_seats,* and *S&P 1500* of nominated outside directors in a firm-year, and *Educ & Prof Backg* is the mean of the first principal component of the following five quality measures: *Degree, MBA, Financial, Legal,* and *Industry* of nominated outside directors in a firm-year. $UD_{s,t}$ is an indicator variable, and it equals one if state *s* in which a firm is incorporated has passed a UD by year *t*, and zero for otherwise. *Post* is an indicator variable that equals one for the year from the UD adoption year onward. Control firms follow the *Post* definition of their matched treatment firms. We include firm-cohort fixed effects (Firm-Cohort FE) and headquarters state-year-cohort fixed effects (State-Year-Cohort FE) in all regressions. Estimates are based on OLS regressions with robust standard errors clustered at the incorporation-state level. We use the same control variables as in Table 3. Standard errors are reported in parentheses. Significance at the 10%, 5% and 1% level (two-tailed) are indicated by *, ** and ***, respectively.

	(1)	(2)	(3)	(4)
Y=	*Experience*		*Educ & Prof Backg*	
UD (0/1) (β_1)	0.343***	0.433***	-0.013	0.078
	(0.074)	(0.071)	(0.150)	(0.173)
UD×Non-Hi tech (β_2)	**-0.217****	**-0.287*****	**0.051**	**-0.050**
	(0.099)	**(0.095)**	**(0.115)**	**(0.121)**
Post×Non-Hi tech (0/1)	0.150***	0.197***	0.017	0.130
	(0.046)	(0.038)	(0.102)	(0.094)
Observations	4,351	4,100	4,351	4,100
Adjusted R^2	0.559	0.556	0.623	0.624
$\beta_1 + \beta_2$	0.125**	0.146**	0.037	0.028
$\beta_1 + \beta_2$=0 *p*-value	0.011	0.005	0.709	0.769
Firm controls in Table 3	NO	YES	NO	YES
Firm-Cohort FE	YES	YES	YES	YES
State-Year-Cohort FE	YES	YES	YES	YES

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